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**BEFORE THE PUBLIC UTILITIES COMMISSION
OF THE STATE OF HAWAII**

In the Matter of the Application of

HAWAIIAN ELECTRIC COMPANY, INC.

**For Approval of Rate Increases and Revised Rate
Schedules and Rules, and for Approval and/or
Modification of Demand-Side and Load
Management Programs and Recovery of Program
Costs and DSM Utility Incentives.**

Docket No. 04-0113

Direct Testimony of

Stephen G. Hill

On behalf of

The United States Department of Defense

June 14, 2005

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COMMISSION

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Hawaiian Electric Company, Inc.

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INTRODUCTION / SUMMARY

Q. PLEASE STATE YOUR NAME, OCCUPATION AND ADDRESS.

A. My name is Stephen G. Hill. I am self-employed as a financial consultant, and principal of Hill Associates, a consulting firm specializing in financial and economic issues in regulated industries. My business address is P.O. Box 587, Hurricane, West Virginia, 25526 (e-mail: sghill@compuserve.com). A detailed account of my educational background and occupational experience appears in Exhibit DOD 200, attached to this testimony.

O. ON BEHALF OF WHOM ARE YOU TESTIFYING IN THIS PROCEEDING?

A. I am under contract with the Utility Rates and Studies Office of the U.S. Department of the Navy to perform utility cost of capital studies. The Navy presents the Department of Defense and all other Federal Executive Agencies (DOD) in certain defined geographical areas.

Q. WHAT IS THE PURPOSE OF YOUR TESTIMONY?

A. In this testimony, I present the results of studies I have performed related to the appropriate return on equity to be applied to the electric utility operations of Hawaiian Electric Company (HECO, the Company), a subsidiary of Hawaiian Electric Industries, Inc. (HE, the Parent). In addition to my testimony regarding the Company's current cost of equity capital for its electric generation operations, I review the cost of capital testimony provided by Dr. Roger Morin and discuss the shortcomings contained in that testimony.

Q. HAVE YOU PREPARED EXHIBITS IN SUPPORT OF YOUR TESTIMONY?

A. Yes, Exhibits DOD 200 through DOD 203 contain additional detail regarding certain aspects of my narrative testimony in this proceeding. Exhibits DOD 204 through DOD 215 provide the analytical support for the conclusions reached regarding the overall cost of capital for the integrated electric utility operations of HECO presented in the body of the testimony. These Exhibits were prepared by me and are correct to the best of my knowledge

1 and belief.

2

3 **Q. PLEASE SUMMARIZE YOUR TESTIMONY AND FINDINGS CONCERNING THE**
4 **RATE OF RETURN THAT SHOULD BE UTILIZED IN SETTING RATES FOR**
5 **HECO's ELECTRIC UTILITY OPERATIONS IN THIS PROCEEDING.**

6 **A. My testimony is organized into four sections. First, I discuss the cost of capital standard as**
7 **a measure of the return to be allowed for regulated industries, and review the current**
8 **economic environment in which my equity return estimate is made.**

9 **Second, I review the Company's requested capital structure as well as the manner in**
10 **which it has recently been capitalized and provide an assessment of an appropriate**
11 **ratemaking capital structure that will balance economic efficiency and financial safety. Third,**
12 **I evaluate the cost of equity capital for similar-risk utility operations using Discounted Cash**
13 **Flow (DCF), Capital Asset Pricing Model (CAPM), Modified Earnings-Price Ratio**
14 **(MEPR), and Market-to-Book Ratio (MTB) analyses. Fourth, I comment on the pre-filed**
15 **cost of capital testimony as well as the divisional cost of capital analysis submitted by**
16 **Company witness, Dr. Roger Morin.**

17 **I have estimated the equity capital cost of fully-integrated electric utility companies**
18 **to fall in a range of 8.75% to 9.50%. Within that range, due to the Company's relatively low**
19 **financial risk, I estimate the equity cost of the Company's utility operations to be below the**
20 **mid-point of a reasonable range of equity costs for fully-integrated electric utilities —9.0%.**

21 **Applying that 9.0% equity capital cost to the Company's requested permanent**
22 **capital structure and embedded cost rates produces an overall cost of capital of 7.71% (see**
23 **Exhibit DOD-215). That overall return would afford the Company an opportunity to**
24 **achieve a pre-tax interest coverage of 4.29 times. According to Standard & Poor's (S&P)**
25 **most recent bond rating benchmarks that included pre-tax interest coverages, a utility like**
26 **Hawaiian Electric Company, with a S&P business position of 6, can attain an "A" bond**
27 **rating with pre-tax interest coverages ranging from 4.0 to 5.2 times. The equity return and**
28 **capital structure I recommend offers the Company an opportunity to meet that pre-tax**
29 **interest coverage test and, thereby, maintain or improve its current bond rating. Therefore,**

1 the equity return I recommend is sufficient to support the Company's current bond rating
2 and fulfills the requirement of providing the Company an opportunity to earn a return which
3 is commensurate with the risk of its utility operations and serves to support and maintain the
4 Company's ability to attract capital.

5
6 Q. MR. HILL, CAN YOU BRIEFLY EXPLAIN WHY YOUR RECOMMENDED RETURN
7 ON EQUITY FOR HAWAIIAN ELECTRIC COMPANY IS BELOW 10 PER CENT?

8 A. Yes. Simply put, the current market-based cost of capital remains relatively low. As I explain
9 subsequently in my testimony, long-term interest rates (an indicator of overall capital costs)
10 even with recent increases in short-term Treasury rates, remain near 40-year lows. I also
11 present objective evidence in the capital market place that investor return expectations are far
12 more modest than they have been in the past.

13 The most recent rate order for HECO, issued in December of 1995, allowed the
14 Company an equity return of 11.4% on a capital structure comprised of 48.8% common
15 equity. As shown on page 2 of DOD 204 attached to my testimony, the average Baa bond
16 yield in 1995 was 8.2%. Through March, the average Baa bond yield in 2005 was 5.97%—
17 223 basis points lower. Reducing the Company's last equity return award by the drop in
18 interest rates since 1995 supports the reasonableness of an equity return of 9.17% (11.4%
19 less 2.23% = 9.17%). Importantly, the Company is requesting that its rates be set using a
20 capital structure that contains substantially more common equity (55%) that was utilized for
21 ratesetting in 1995 (about 49%). Therefore, the Company has lower financial risk, adding
22 additional support for an allowed return well below the ten percent level.

23 Also, the Company's own testimony in the instant case, supports the accuracy of an
24 equity return recommendation below 10%. Company witness Morin's unadjusted
25 Discounted Cash Flow analyses, absent unnecessary flotation cost adders, indicate current
26 equity capital cost rates for HECO of 9.5%. In addition, Dr. Morin's more recent cost of
27 capital testimony¹ indicates that utility equity capital costs have declined since his Direct

¹ New Hampshire Public Utilities Commission, Docket No. DE 04-177, Public Service Company of New Hampshire, Direct Testimony of Dr. Roger Morin, March 25, 2005.

1 Testimony in this proceeding was filed.

2

3 **Q. HAVE OTHER REGULATORY BODIES DETERMINED SINGLE-DIGIT EQUITY**
4 **RETURNS TO BE APPROPRIATE OVER THE LAST YEAR?**

5 **A. Yes, while *Public Utilities Fortnightly* reports that the majority of the equity return awards**
6 **over the last year (October 2003-October 2004) have been in the 10% to 10.5% range,²**
7 **capital costs have been low and there have been many single-digit equity return awards over**
8 **the past couple of years. Regulatory jurisdictions of New York, New Jersey, Arkansas,**
9 **Tennessee, Colorado, Connecticut, New Hampshire, Indiana, and Wyoming have set equity**
10 **returns below 10% during 2003 and 2004.³ In addition, the West Virginia Public Service**
11 **Commission last year set the equity return of a water utility company at 7.0%.⁴**

12

13 **Q. WHY SHOULD THE COST OF CAPITAL SERVE AS A BASIS FOR THE PROPER**
14 **ALLOWED RATE OF RETURN FOR A REGULATED FIRM?**

15 **A. The Supreme Court of the United States has established, as a guide to assessing an**
16 **appropriate level of profitability for regulated operations, that investors in such firms are to**
17 **be given an opportunity to earn returns that are sufficient to attract capital and are**
18 **comparable to returns investors would expect in the unregulated sector for assuming the**
19 **same degree of risk. The Bluefield and Hope cases provide the seminal decisions [Bluefield**
20 **Water Works v. PSC, 262 US 679 (1923); FPC v. Hope Natural Gas Company, 320 US**
21 **591 (1944)]. These criteria were restated in the Permian Basin Area Rate Cases, 390 US**

² *Public Utilities Fortnightly*, November 2004, pp. 49-51; 30 out of 50 equity return awards over the October 2003 through November 2004 period were 10.5% or below.

³ New York: Rochester Gas & Electric, 9.96%, NY PUC Lexis 140 (3/7/03); St. Lawrence Gas Co., 9.5%, NY PUC Lexis 427 (8/4/03); Crown Point Telephone Corp., 8.93%, NY PUC Lexis 474 (8/27/03); Chazy & Westport Telephone Corp., 8.01%, NY PUC Lexis 475 (8/27/03); Fishers Island Electric, 9.0%, NY PUC Lexis 497 (9/19/03). New Jersey: Jersey Central Power & Light, 9.5%, NJ PUC Lexis 248 (8/1/03); Rockland Electric Co., 9.75%, NJ PUC Lexis 259 (7/31/03). Arkansas: Arkansas Western Gas Co., 9.9%, Ark. PUC Lexis 397 (7/17/03). Tennessee: Tennessee-American Water Co., 9.9%, Case No. 03-00118 (6/27/03). Wyoming: Lower Valley Energy, Inc., 9.21%, Wyo. PUC Lexis, 128 (4/30/03). Colorado: Phillips County Telephone, 9.5%, Col. PUC Lexis 1428 (12/31/03). Connecticut: Connecticut Light & Power, 9.85%, Docket No. 03-07-02 (12/17/03). New Hampshire: Kearsarge Telephone Company, 8.89%, Docket No. DT 01-221, Verizon New Hampshire, 8.82%, Docket No. DT 02-110; Indiana: Indiana-American Water Company, Docket No. 42520, 9.25% (12/18/04).

⁴ W.V.P.S.C. Case No. 03-0353-W-42T, West Virginia-American Water Works, January 2, 2004.

1 747 (1968). However, the Court also makes quite clear in Hope that regulation does not
2 guarantee profitability and, in Permian Basin, that, while investor interests (profitability) are
3 certainly pertinent to setting adequate rates, those interests do not exhaust the relevant
4 considerations.

5 As a starting point in the rate-setting process, then, the cost of capital of a regulated
6 firm represents the return investors could expect from other investments, while assuming no
7 more and no less risk. Since financial theory holds that investors will not provide capital for
8 a particular investment unless that investment is expected to yield their opportunity cost of
9 capital, the correspondence of the cost of capital with the Court's guidelines for appropriate
10 earnings is clear.

11 12 **I. ECONOMIC ENVIRONMENT**

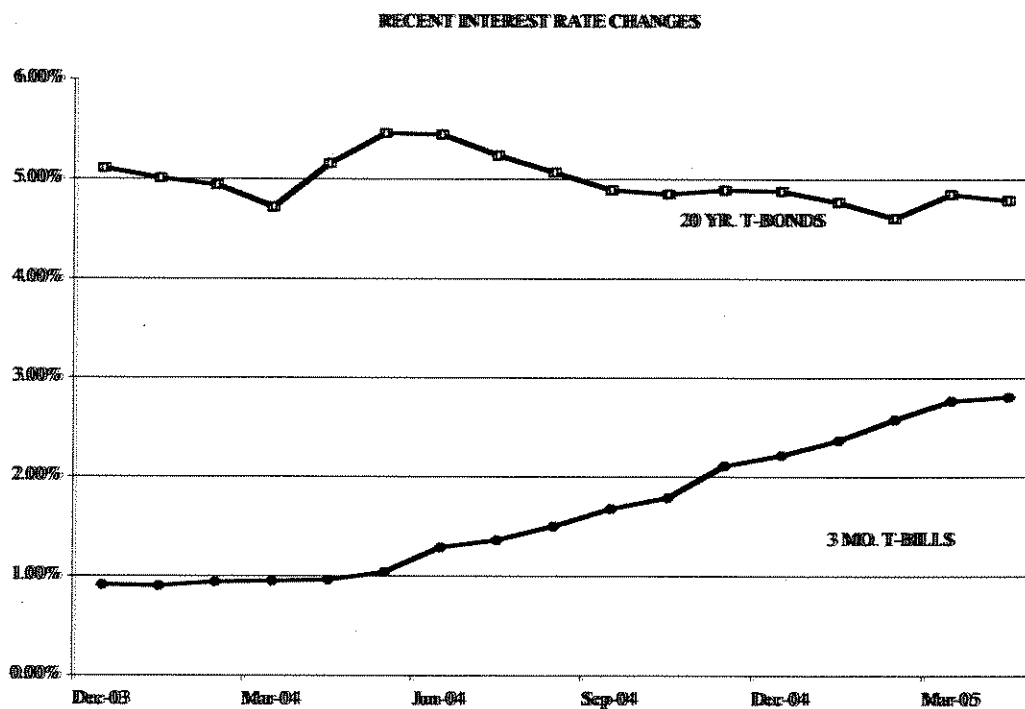
13
14 **Q. WHY IS IT IMPORTANT TO REVIEW THE ECONOMIC ENVIRONMENT IN**
15 **WHICH AN EQUITY COST ESTIMATE IS MADE?**

16 **A. The cost of equity capital is an expectational, or *ex ante*, concept. In seeking to estimate the**
17 **cost of equity capital of a firm, it is necessary to gauge investor expectations with regard to**
18 **the relative risk and return of that firm, as well as that for the particular risk-class of**
19 **investments in which that firm resides. Because this exercise is, necessarily, based on**
20 **understanding and accurately assessing investor expectations, a review of the larger**
21 **economic environment within which the investor makes his or her decision is most**
22 **important. Investor expectations regarding the strength of the U.S. economy, the direction**
23 **of interest rates and the level of inflation (factors that are determinative of capital costs) are**
24 **key building blocks in the investment decision. Those factors should be reviewed by the**
25 **analyst and the regulatory body in order to assess accurately investors' required return—the**
26 **cost of equity capital to the regulated firm.**

27

1 Q. WHY DO YOU BELIEVE AN EQUITY RETURN IN THE RANGE OF 8.75% to 9.50%
2 IS REASONABLE FOR AN INTEGRATED ELECTRIC UTILITY IN TODAY'S
3 ECONOMIC ENVIRONMENT?

4 A. The overall level of fixed-income capital costs has been relatively low for several years, and
5 continues to be quite low at the current time. Although, as shown in the chart below, there
6 has been some upward movement in *short-term* interest rate levels over the past year as the
7 economy has improved, long-term interest rates have remained relatively steady. Moreover,
8 as the economy began to improve at mid-year 2004 and as short-term rates started to climb
9 in response to Federal Reserve credit-tightening, long-term rates actually fell. This indicates
10 that even though the Fed has raised short-term interest rates, investors may not be convinced
11 that the overall level of economic growth will be sufficient to warrant an increase in long-
12 term interest rates.



13

14

15 Also, there are examples in the capital marketplace indicating that investor return
16 requirements are low by historical standards.

17 A recent A.G. Edwards report on the gas utility industry, which is relatively similar

1 in risk to the electric utility industry, shows that market return expectations for gas utility
2 stocks are well below historical earned returns.⁵ The report states that, for a sample of 20
3 large and small gas distributors, the median total return expectation (dividend yield plus
4 expected growth—a DCF-type calculation) is 8.2%. None of the total return estimates for
5 the gas distribution companies published by AG Edwards is above 9%.

6 In addition, in a letter recently published by *Public Utilities Fortnightly* an electric
7 industry analyst confirms that investors currently expect single-digit returns from their
8 utility investments:

9
10 “Finally, let’s get real about investor expectations,
11 now that investors have begun to get real. Articles on the
12 topic fill the financial journals. They feature variants on this
13 theme: Over time the average equity investment produces an
14 annual total return (dividends plus stock price appreciation)
15 of 6.5 per cent per year in real terms, the bulk of which
16 comes from the dividend component. Add inflation
17 expectations to that number, and you get an 8.5 to 9.5 percent
18 return in nominal terms. The average back-to-basics utility
19 yields about 5 to 6 percent and might grow 3 to 4 percent per
20 year, which adds up to produce a total return expectation of 8
21 to 10 percent per year, not far from the return the journals
22 posit for the market.” (Hyman, Leonard, Senior Consultant,
23 R.J. Rudden Associates, “Letters to the Editor, *Public*
24 *Utilities Fortnightly*, August 2004, p. 10)

25
26 The “articles in the financial journals,” to which the author of the preceding quote
27 refers, relate to recent research involving the market risk premium. The market risk premium
28 is the additional return above the risk-free rate of interest that investors expect to earn by
29 investing in stocks rather than risk-free U.S. Treasury securities. The “traditional” view
30 (largely supported by the earned return data over the past 70 years published by Ibbotson
31 associates) assumes that investors require a risk premium of about 6 1/2% above the risk-
32 free rate to invest in stocks. With a current long-term T-Bond yield of approximately 5%,
33 that traditional assumption indicates an investor expectation of an 11.5% return for the stock
34 market in general [5% + 6.5% = 11.5%]. Of course, expected utility returns would be
35 lower, because utilities have less investment risk than the stock market generally.

⁵ A.G. Edwards, “Gas Utilities Quarterly Review,” January 5, 2005.

1 However, the new research referenced in the cite above indicates that Ibbotson data
2 is skewed upward and the actual market risk premium is much, much lower—in the range of
3 3% to 4.5%⁶. In other words, the recent academic research indicates that investor return
4 requirements are considerably lower than traditionally assumed. Even Roger Ibbotson,
5 whose firm (Ibbotson Associates) is probably the largest purveyor of historical market
6 return data, recently published a paper confirming that risk premium expectations for the
7 future are below what they were in the past. While Ibbotson's projected risk premium of
8 4% to 6% for investors, is lower than historical return averages indicate, his estimates are at
9 the upper end of the spectrum produced by the current research.⁷ With a current T-Bond
10 yield of about 5%, the new information regarding expected equity risk premiums confirms
11 that investor's stock market return expectations range from approximately 8% to 10%—i.e.,
12 single digit equity returns.

13 Finally, at page 27 of his Direct Testimony in this proceeding, Dr. Morin references
14 a 2003 study published in Financial Management by Harris, Marston, Mishra and O'Brien.
15 That study indicates that over a 1983-1998 study period, the average equity risk premium of
16 utility stocks over 20-year Treasury Bonds was 4.15%. As shown in the graph on page 6,
17 the current average yield of 20-year T-Bonds is 4.85%. Adding the utility risk premium,
18 obtained from a source on which Dr. Morin elects to rely for authority, to the current T-
19 Bond yield provides an equity cost indication of 9.0% [$4.85\% + 4.15\% = 9.0\%$].

20 The information available to investors in the capital markets confirms that my
21 8.75%-9.50% equity return range for the electric utility operations under consideration here
22 is reasonable, if not overly conservative (i.e., too high). In addition, those data represent
23 information to which investors are exposed in the equity marketplace for rate-regulated
24 companies and underscore the fact that, currently, investor return requirements for that type
25 of equity investment are low by historical standards.

⁶ Fama, E., French, K., "The Equity Premium," *The Journal of Finance*, Vol. LVII, No. 2, April 2003, pp. 637-659.

⁷ Ibbotson, R. Chen, P., "Long-Run Stock Returns: Participating in the Real Economy," *Financial Analysts Journal*, January/February 2003, pp. 88-89.

1 Q. ARE THERE OTHER INDICATIONS THAT CAPITAL COSTS ARE AT
2 HISTORICALLY LOW LEVELS?

3 A. Yes. Another indication of the reason investors are willing to buy and hold stocks that offer
4 what seem to be "low" returns is shown in DOD 204, page 1. It depicts Moody's Baa-
5 rated bond yields from 1984 through April 2005. Page 1 of DOD 204 shows that interest
6 rates and capital costs remain very low relative to the interest rate levels that existed in the
7 mid-1980s, and have continued a general downward trend begun in 2000.

8 Also, page 2 of DOD 204, which presents the year-average Moody's Baa-rated
9 bond yields for each year over the past 36 years (1968-2004), shows that Baa-rated bond
10 yields in 2004 were below the bond yield levels seen in the U.S. in the late 1960s. Also, the
11 most recent average Baa-rated utility bond yield, 5.83%⁸, falls below the lower range of
12 interest rates that have existed over the past 40 years. (See DOD 204, page 2) Simply put, a
13 fundamental reason that the current cost of common equity capital for electric utility
14 operations of 8.75% to 9.50% is reasonable is that capital cost rates are lower than they
15 have been in more than thirty years.

16 The above data indicate that capital costs, even with the recent credit tightening by
17 the Federal Reserve Bank (the Fed), remain at low levels and generally support the efficacy
18 of my range of equity capital costs. However, it is important to note here that equity capital
19 cost rates and bond yields do not move in lock-step fashion over time. In fact, the variability
20 of that return differential is a fundamental reason why risk premium type analyses—which
21 attempt to quantify the additional return over bond yields required by equity investors—are
22 not reliable as primary indicators of equity capital cost. Therefore, it is necessary to perform
23 an independent cost of equity capital analysis, rather than to simply "index" the cost of
24 capital to current interest rates.

25

⁸ Value Line *Selection & Opinion*, most recent six weekly editions (3/4/05-4/8/05, inclusive), 20/30-year
Baa-rated utility bond yield averages.

1 Q. PLEASE BRIEFLY DESCRIBE THE INTEREST RATE CHANGES THAT HAVE
2 OCCURRED IN THE U.S. ECONOMY OVER THE PAST FEW YEARS AND HOW
3 THEY IMPACT CAPITAL COST RATE EXPECTATIONS FOR THE FUTURE.

4 A. The substantial interest rate decline that occurred following the historically high interest
5 rates in the early 1980s spurred increased economic activity in the U.S. The rate of growth
6 in the U.S. Gross Domestic Product (GDP) began to increase at a rapid rate by the end of
7 1987 and showed signs of continuing to gain strength. That increased economic activity, in
8 turn, led to increased inflation expectations (a rapid rate of economic growth creates
9 shortages in labor and materials, driving up the price of those factors of production, which
10 ultimately results in higher prices in all sectors of the economy). The expectation of
11 increased inflation, in turn, caused the Fed to act aggressively to slow down what was widely
12 believed to be an overheating economy. The very sharp interest rate rise that followed in late
13 1987 and 1988, shown on page 1 of DOD 204, succeeded in damping down the economy,
14 reducing inflationary pressures, and allowing interest rates to fall again.

15 Since that time, the interaction between the Federal Reserve's moves to expand or
16 restrain the money supply and burgeoning inflation has been a primary influence in the
17 U.S. macro-economy and the level of interest rates. Overall, as inflation has remained calm
18 and economic activity has been moderate, interest rates have trended downward, but that
19 general downward direction has been interrupted when investors (and/or the Fed) believed
20 that falling interest rates would spur too-rapid economic growth. Rapid economic growth
21 can create unwanted inflation. Anticipating that higher inflation and interest rates might be
22 the result of rapid economic expansion, investors have reacted to positive economic news
23 (e.g., increasing GDP growth rates, lower unemployment) or negative inflation news (e.g.,
24 increasing commodity prices, factory capacity or labor shortages) by bidding down debt
25 prices and driving up interest rates.

26 As shown on page 2 of DOD 204, Baa-rated debt yielded 7.87%, on average, in
27 1999, while, in 2000, equivalently rated debt was priced to yield 8.36%, on average. That
28 cost rate increase was due to investors' concerns regarding the continued strength of the
29 U.S. economic expansion and the potential for increased inflation caused by what was

1 perceived to be a rapid level of growth. However, that rapid rate of economic growth did not
2 come to pass, and the interest rate increases engineered by the Federal Reserve in 2000 to
3 slow down a rapidly growing economy worked a little too well, resulting in declining
4 economic growth.

5 Then, in response to an economy that was slowing down, the Fed elected to increase
6 the supply of money by dramatically lowering the Federal Funds rate. The Federal Funds
7 rate is the rate at which money center banks can lend funds on an overnight basis—a
8 fundamental building block of capital costs in the U.S. In order to revive what became a
9 slowing economy, the Fed lowered short-term interest rates eleven times in 2001 (and again
10 in early November 2002 as well as at mid-year 2003). By 2003, Baa-rated debt was trading
11 at prices that produced yields averaging 6.76% and in 2004 that average fell further to
12 6.39%.

13 More recently, in response to a recovering economy, the Fed has reversed course
14 and has begun raising short-term interest rates. Over the past year, the Federal Funds rate
15 has moved upward from about 1% to about 2.75% currently. As shown previously,
16 however, long-term rates have actually declined slightly over the last six months.

17 As Value Line notes in its most recent Quarterly Review regarding economic
18 growth, inflation and the interest rate environment, the current expectation is that as the
19 economy continues to expand during 2005 and 2006, inflation and interest rates will
20 increase to some degree. Importantly, with regard to the estimation of capital costs, the
21 interest rates projected by Value Line through 2008, even with anticipated increases, will
22 remain below the levels that existed in 1999 and 2000. The following excerpts from Value
23 Line explain how a relatively low interest rate environment will be preserved:

24
25
26 **Economic Growth:** As noted above, the economy continues
27 to muddle along at a moderate, sustained pace that should
28 continue without serious interruption through at least 2005
29 and 2006 and quite possibly into the last years of this
30 decade. To this point, the business expansion, which is now
31 more than three years old, has been largely consumer driven.
32 Specifically, GDP growth, which topped 4% early last year,
33 before moderating into the 3.5% range thereafter, was fueled,
34 in part, by strong housing demand and selective strength in

1 retailing. [Chart omitted] As 2004 unfolded, gains in
2 nonresidential fixed investment (the so-called capital goods
3 sector) accelerated. Now, that heretofore moribund side of
4 the economy seems poised to play a more central role in the
5 business upturn, which is a good thing as our economic
6 forecast has built in a gradual contraction in home-building
7 and home sales activity over the course of 2005 and 2006.

8 ...
9 Finally, there's the matter of interest rates. Low long-term
10 rates (including those covering mortgages) have been
11 instrumental in sustaining high levels of housing and auto
12 demand over the past few years. We expect attractive
13 financing terms to be the rule in 2005, even as the Federal
14 Reserve slowly raises short-term rates. It should be noted
15 that even with those likely rate increases, borrowing costs
16 would still be sufficiently low, in our opinion, to allow the
17 consumer markets to more or less hold their own this year.

18
19 **Inflation:** In 2004, produces (wholesale) prices rose by
20 3.6%, which was higher than the 2003 increase of 3.2%.
21 Consumer prices added 2.7%. That, too, was up from the
22 2.3% gain recorded in 2003. The main factor in boosting
23 inflation last year was the soaring price of oil. Excluding oil,
24 inflation was low again. Now, with oil prices likely to be a bit
25 more stable going forward, we would expect inflation to
26 moderate in 2005. Such a favorable pricing scenario would
27 help the Fed retain a measured approach to raising interest
28 rates this year [chart omitted].

29 ...
30 **Interest Rates:** ... This benign rate view assumes that the
31 level of both business activity and inflation (with the latter
32 abetted by stabilizing oil prices) will hold within acceptable
33 ranges going forward. Should the rate of GDP growth move
34 materially outside of the projected average range of 3%-4%,
35 between now and the closing years of this decade, it is almost
36 certain that the Fed would adjust its rate approach, be either
37 tightening or loosening the monetary strings. The
38 consequences for the economy could be significant. We also
39 emphasize that the projected rate of growth cited above
40 represents an average for the period, with likely departures
41 from that long-term band. The period between now and the
42 final years of this decade also could see a brief or somewhat
43 longer recession, as the up cycle would be nearly a decade in
44 length by 2010, which is long by historical standards. Fed
45 rate policies could be critical in how long the business upturn
46 proceeds. For now, we expect slowly rising interest rates over
47 the next 3 to 5 years.

48
49 (The Value Line Investment Survey, *Selection & Opinion*, February 25, 2005, pp. 1850-
50 1852).

1 In that most recent Quarterly Economic Review, Value Line projects long-term Treasury
2 bond rates will average 5.1% in 2005 and 5.7% through 2006. The recent six-week average
3 30-year T-bond yield is 4.76% (data from Value Line, *Selection & Opinion*, six weekly
4 editions, March 4 through April 8, 2005, inclusive).

5 Also, while Value Line projects that short-term Treasury Bill rates will rise from
6 1.4% in 2004 to 3.8% in 2009, that investor service publication projects a much smaller
7 increase in corporate bond yields: 5.6% in 2004 to 6.8% in 2009. Finally, those projected
8 interest rate levels (3.8% for T-Bills and 6.8% for AAA-rated Corporate Bonds) are well
9 below the average levels for those securities in 2000 [5.8% for T-Bills and 7.6% for
10 Corporate Bonds]. Therefore, the indicated expectation is that interest rates are likely to
11 move somewhat higher in coming years (as long as the economic recovery stays on track),
12 but will remain at relatively low levels for some time to come.

13
14 Q. IS IT REASONABLE TO CONCLUDE THAT UTILITY INVESTORS ARE AWARE OF
15 THE EXPECTATIONS FOR SOMEWHAT HIGHER INTEREST RATES IN THE
16 FUTURE, AND HAVE REACTED TO THAT NEWS?

17 A. Yes. A widely accepted tenet of modern finance is that U.S. capital markets are efficient in
18 quickly assimilating into stock prices news that impacts stock valuation. Higher interest
19 rates have been forecast for some time and, it is reasonable to believe, utility investors have
20 incorporated that expectation into the stock prices they are willing to provide for utility
21 stocks.

22
23 Q. ARE THERE ADDITIONAL REASONS TO BELIEVE THAT COMMON EQUITY
24 CAPITAL COSTS FOR UTILITIES ARE GENERALLY LOWER TODAY THAN THEY
25 HAVE BEEN IN THE PAST?

26 A. Yes. The recently enacted change in the Federal tax law lowered the tax rate on dividends.
27 Under the old law, dividends were taxed at rates that typically were approximately 30%⁹;

⁹ Prior to the tax law change, federal income tax rates were 10%, 15%, 27%, 30%, 35%, or 38.6% depending upon the relevant income bracket. Under the newly passed law, the 27% drops to 25%, the 30% to 28%, the 35% to 33% and the 38.6% to 35%. Since the old 27% tax bracket applied to married couples with a

1 now dividends are taxed at no more than 15%. The result of this tax cut is that investors are
2 keeping a greater percentage of dividends, and dividend-paying stocks such as utilities have
3 become more valuable than they were before the change in the tax law. In other words,
4 because investors can now keep more of their dividends from their utility investment, they
5 are willing to pay more for those same stocks, resulting in a lower cost of equity capital.

6 The impact of the tax change on the stock prices of utilities has been recognized by
7 investor advisory services:

8
9 **"Tax reform has resulted in a fundamental shift in the**
10 **group's trading range. We estimate that the reduction in**
11 **dividend and capital gains taxes should result in a 10%**
12 **increase in the average gas utility stock price. Prior to tax**
13 **reform, the median gas utility P/E [price/earnings ratio]**
14 **traded in a range of 11.5X to 14.5X. With the tax reduction,**
15 **we believe the new trading range is now 12.5X to 16.0X."**
16

17 A. G. Edwards, Gas Utilities Quarterly Review, July 6, 2004, p. 5.

18 A simple example will facilitate understanding how the tax law change has lowered
19 the cost of equity. Assume a utility with a dividend of \$0.50, a stock price of \$10, and a
20 long-term investor-expected growth rate of 5.5%. A simple DCF estimate of the cost of
21 equity for that utility would be 10.5%, comprised of a dividend yield of 5.0% ($\$0.50/\10)
22 and a growth rate of 5.5%. When the tax law changes, investors increase the price they are
23 willing to provide for that stock by 10%, to \$11 per share [$\$10/\text{share} \times 1.10 = \$11/\text{share}$].
24 Due to the re-valuation of the stock to \$11/share, the dividend yield now becomes 4.5%
25 [$\$0.50/\$11 = 4.545\%$, rounded to 4.5%]. Because the tax law does not affect the company
26 or its utility operations, its anticipated long-term growth does not change; it remains at
27 5.5%. The new cost of equity, however is 10% (4.5% dividend yield + 5.5% growth rate),
28 roughly 50 basis points below the pre-tax change cost of equity capital. In sum, another
29 factor contributing to the relatively low cost of common equity capital for utilities in the
30 current capital markets is the recent dividend tax law change.

31

combined income of no more than \$47,450, it is reasonable to say that the dollar weighted dividends paid to most individual investors were in brackets of between 27% and 38.6%.

1 Q. DOES THE CURRENT LEVEL OF MARKET-TO-BOOK RATIOS EXISTING IN
2 THE ELECTRIC INDUSTRY, ALONG WITH INVESTORS' EXPECTATIONS
3 REGARDING THE RETURN ON EQUITY THAT ELECTRIC UTILITIES ARE
4 EXPECTED TO EARN, SUPPORT YOUR EQUITY COST ESTIMATE IN THIS
5 PROCEEDING?

6 A. Yes. It is a long-held and widely-understood tenet of regulatory finance that when investors
7 are providing market prices above the book value of utility stocks, the return investors
8 expect (the cost of capital) is below the return the utility will earn on that book value. In
9 other words, when market prices are above book value, investors expect utilities to earn
10 accounting returns (ROEs, returns on book value) that are greater than the market-based
11 cost of equity capital for those companies.

12 In the current market environment, the market price of electric utility stocks is 71%
13 higher than their book value (i.e., M/B = 1.71).¹⁰ Moreover, Value Line reports that electric
14 utilities are expected to earn returns on the book value of their equity capital over the next
15 three to five years of 11.0% to 11.5%.¹¹ Those data indicate that it is unreasonable to
16 believe the cost of equity capital for electric utilities is even near, much less above 11% (e.g.
17 11.5%, as Dr. Morin indicates), and that the lower cost of equity that I recommend, is more
18 representative of investor expectations.

19

20 Q. WHAT IS THE DIFFERENCE BETWEEN THE EXPECTED RETURN AND THE
21 COST OF CAPITAL?

22 A. The expected return is the return on book equity (ROE) that the utility is expected to earn.
23 That return is an accounting return. It is based, in part, on the return allowed by the
24 regulator, the company's operating efficiency and on other income available to the firm (if
25 the firm has unregulated operations). The cost of equity capital is the return investors
26 require to commit equity capital to a particular enterprise. That is the cost of equity capital to
27 the firm—the minimum return investors require in order to invest in a particular type of

¹⁰ AUS Utility Reports (formerly CA Turner), April 2005, p. 10.

¹¹ The Value Line Investment Survey, *Ratings & Reports*, April 1, 2005, p. 695.

1 company. That return is a market-based return, because whatever return the investor receives
2 (yield + dividend growth) will be measured against the market price the investor provided to
3 purchase the stock.

4 Regulators seek to set the allowed return equal to the cost of equity capital for the
5 same reason they set the return allowed on utility debt equal to the cost of that type of
6 capital. Utility rates should be cost-based. That includes the cost of money—equity and
7 debt. Investors understand that utility returns are allowed and earned on the book value
8 (original cost less depreciation) of the utility's plant investment. That long-standing
9 regulatory paradigm has been in existence for many, many years and, through
10 informationally efficient markets, utility investors are aware of that fact.

11

12 **Q. PLEASE EXPLAIN IN MORE DETAIL WHY A UTILITY'S MARKET-TO-BOOK**
13 **RATIO IS INDICATIVE OF THE RELATIONSHIP BETWEEN THE EXPECTED**
14 **RETURN AND THE COST OF EQUITY CAPITAL.**

15 **A. A simple example will illustrate this important point. Assume that a utility has a book value**
16 **of equity capital equal to \$10 per share. Let's also assume, for simplicity of exposition, this**
17 **utility pays out all its earnings in dividends. If regulators allow the utility a 12% return on**
18 **that equity, investors will expect the company to earn (and pay out) \$1.20 per share. If**
19 **investors require a 12% return on this investment, they will be willing to provide a market**
20 **price of \$10 per share for this stock (\$1.20 dividends/\$10 market price = 12% required**
21 **return). In that case, the allowed/expected return (12%) is equal to the cost of capital**
22 **(investors' required return, 12%), and the per-share market price is equal to the book value**
23 **($M=B$, or $M/B=1.0$).**

24 To conform our example to the market situation that presently exists with electric
25 utilities, let's assume that investors' required return (the utility's cost of equity capital) falls
26 to 10%, but the utility continues to be allowed a 12% return on the equity portion of its rate
27 base investment. Investors would be drawn to a utility stock in a risk class for which they
28 require a 10% return but which was expected to pay out a 12% return. This increased
29 demand by investors would result in an increase in the market price of the stock until the

1 total share yield equaled the investors' required return. In our example, that point would be
2 \$12 per share (\$1.20 dividends/\$12 market price = 10% required return). In that case, the
3 allowed/expected return (12%) is greater than the required return (10% - the cost of equity
4 capital) *and* the per-share market price (\$12/share) exceeds the book value (\$10/share),
5 producing a market-to-book ratio greater than one ($\$12/\$10 = 1.20$).

6 Therefore, the market-to-book / expected return relationship that actually exists
7 today in the market for utility stocks indicates that investors expect that those companies
8 will earn a return on the book value of their equity (ROE) which exceeds the cost of equity
9 capital.

10
11 **Q. HOW CAN ELECTRIC UTILITIES HAVE PROJECTED BOOK EQUITY RETURN**
12 **OF 11% to 11.5% AND A COST OF EQUITY OF 8.75% to 9.50%?**

13 **A.** If investors were providing stock prices (market prices) that approximated the book value of
14 electric utilities, that is if $M/B \approx 1.0$, and those companies were expected to earn an 11%
15 return on book value, then it would be reasonable to believe that the cost of capital
16 (investors' market-required return) would approximate 11%. However, if investors are
17 willing to provide a stock price that is considerably more than book value for a group of
18 stocks that is expected to earn an 11% return on book value, their expected return on that
19 stock price (the cost of equity capital to the firm) must be less than the expected return on
20 book value—i.e., less than 11%. Currently, investors are paying about 170% of book value
21 for their electric utility investments. Therefore, they must require a return below the 11%
22 expected to be earned on book value. In that regard, the range cost of equity estimates I
23 provide in this proceeding (between 8.75% and 9.50%) is reasonable.

24 Finally, the market price/book value data cited above provides dramatic evidence that
25 Dr. Morin's equity return estimate of 11.5% cannot represent investor's expectations. If an
26 investor required an 11.5% return on a stock that she expected to earn 11% to 11.5% on
27 book value, would she pay more than book value for that stock? Clearly, the answer is no.
28 Therefore, Dr. Morin's cost of equity estimate cannot be accurate.

1 Q. DOES THIS RELATIONSHIP BETWEEN MARKET PRICE, BOOK VALUE, THE
2 EARNED RETURN AND THE COST OF CAPITAL HOLD FOR UNREGULATED
3 FIRMS?

4 A. No. Unlike regulated firms, there is no nexus between the book value of an unregulated firm
5 and its earnings. Therefore, a market price above book value is not indicative of whether or
6 not an unregulated firm is earning its cost of capital. For a utility firm however, a market
7 price well above book value indicates that investors expect that firm to earn a return above
8 the return they require to invest in that type of firm (the cost of equity capital). Similarly, a
9 utility market price below book value connotes an investor expectation that that firm will
10 earn an ROE that is below that which investors require (the firm's cost of equity capital).

11
12 Q. IS THE RELATIONSHIP BETWEEN A UTILITY'S MARKET-TO-BOOK RATIO,
13 THE EXPECTED BOOK RETURN, AND THE COST OF EQUITY CAPITAL YOU
14 HAVE JUST OUTLINED WELL DOCUMENTED IN THE REGULATORY
15 FINANCIAL LITERATURE?

16 A. Yes. The DCF model is often referred to as the "Gordon model" because of the definitive
17 work Professor Myron Gordon has done regarding the DCF model and the cost of equity
18 capital of utilities. Professor Gordon has explained that the market-to-book value ratio is
19 greater than (equal to, less than) one when the ratio of the allowed (or expected) rate of
20 return to the cost of capital is greater than (equal to, less than) one. Gordon, M.J., The Cost
21 of Capital to a Public Utility, 63-64 (1974). There is additional support in the financial
22 literature for the value of market-to-book ratios in regulation.¹²

23 Dr. Morin also has recognized the theoretical relationship between utility market
24 price, book value, ROE and the cost of equity capital. With "P" representing the stock
25 price, "B" the per share book value, "r" the expected return on equity (the ROE), and
26 "K" the cost of equity capital, Dr. Morin states:

27

¹² Kolbe, Read, Hall, The Cost of Capital, Estimating the Rate of Return for Public Utilities, 25-33
(1986); Lawrence Booth, ("The Importance of Market-to-Book Ratios in Regulation," NRRI Quarterly
Bulletin, Vol. 18, No. 4, at 415-16 (Winter 1997))

1 "From Equation 10-6, it is clear that the market-to-book, or
2 P_0/B , will be unity [1.0] if $r = K$, greater than unity if $r > K$,
3 and less than unity if $r < K$:

$$\begin{array}{ccc} & > & > \\ & P/B = 1.0 \text{ as } r = K. & \\ & < & < \end{array}$$

4
5
6
7 (Morin, R. Regulatory Finance, Utilities' Cost of Capital,
8 Public Utilities Reports, Inc., Arlington VA, 1994, p. 248)

9
10 It is important to realize that the relationship between market price and book value
11 for a utility operation is not a linear or one-for-one relationship. That is, just because the
12 stock price of a particular utility is, say, 50% above its book value does not indicate that its
13 cost of equity is 50% below the utility's expected book return. Also, there are differences
14 between book value and rate base, which means that, even if a utility is allowed and expected
15 to earn its cost of equity capital, the market price may not exactly equal book value. For
16 utility operations, it will approximate book value, however, as supported in the financial
17 literature noted above. Therefore, while market-to-book ratios do not provide a definitive
18 answer with regard to a utility's cost of equity capital, when they are reviewed in
19 conjunction with expected returns on book equity, market-to-book ratios provide valuable
20 information regarding the proper range of equity capital costs for utilities.

21
22 Q. MR. HILL, ARE YOU INDICATING THAT UTILITY STOCK PRICES SHOULD
23 EQUAL BOOK VALUE?

24 A. No. Regulation is not designed to be a stock price setting mechanism, and regulators should
25 not target any particular stock price in the ratesetting process. Investors set the market price,
26 depending on the risk/return matrix presented to them in the current and expected market
27 environment. However, the relationship among utility market price, book value, expected
28 ROE and the cost of capital is well known and offers valuable information regarding the
29 reasonableness of a cost of equity estimate. Without making any determination of what
30 electric utility stock prices ought to be, we can observe these facts: utility market prices are
31 about 70% higher than book value. Utilities are projected to earn a return on book value of
32 11% to 11.5%. Because utility investors are paying substantially more than book value for a

1 share of utility stock, their required market return (the cost of equity capital to the utility)
2 must be well below that expected 11% to 11.5% return on book value.
3

4 Q. HAS DR. MORIN TESTIFIED RECENTLY IN OTHER REGULATORY
5 PROCEEDINGS THAT THE DCF UNDERSTATES THE COST OF EQUITY WHEN
6 UTILITY MARKET PRICES ARE ABOVE BOOK VALUE?

7 A. Yes, he has provided testimony to that effect recently in both Georgia and New Hampshire
8 (two jurisdictions in which he and I are both involved in utility rate proceedings). While he
9 has discussed what he believes to be problems with the DCF in this proceeding, he has not
10 provided any testimony thus far regarding the ability of the DCF to accurately estimate the
11 cost of equity when market prices are different from book value. However, as I will
12 demonstrate subsequently, Dr. Morin's position on that point is contrary to fundamental
13 financial theory as well as logically inconsistent with his other published statements (e.g.,
14 the quote cited above).
15

16 Q. PLEASE SUMMARIZE THE INFORMATION YOU HAVE PRESENTED WITH
17 REGARD TO THE ECONOMIC ENVIRONMENT AND THE COST OF COMMON
18 EQUITY FOR HECO.

19 A. I have estimated the cost of common equity for fully-integrated electric utilities like
20 Hawaiian Electric Company to be in the range of 8.75% to 9.50%. That range of equity
21 costs is supported by many objective factors in the capital market place today.

22 First, the general level of capital costs, as evidenced by current interest rate levels, is
23 near a 40-year low. Even with the modest interest rate increases expected over the next few
24 years, capital costs will continue to be at relatively low levels. Second, investor services and
25 investment analysts are advising clients to expect utility returns well below 10%, and below
26 the equity cost estimates I recommend. Third, changes in the tax law with respect to
27 dividends have made utilities more valuable to investors and, thus, have reduced investor
28 return requirements. Fourth, long-standing and widely-understood relationships between
29 utility market price, book value and expected equity return indicate that equity returns below

1 10% are reasonable. Fifth, the most recent research in the field of financial economics
2 regarding the market risk premium and investor-required returns, supports forward-looking
3 investor expectations for common equity returns in the 8% to 10% range. In sum, the
4 objective evidence available to investors in the capital marketplace today confirms the
5 reasonableness of the 8.75% to 9.50% range of equity capital costs for integrated electric
6 utilities presented in this testimony.

7
8 **II. CAPITAL STRUCTURE**
9

10 **Q. WHAT IS THE CAPITAL STRUCTURE REQUESTED BY THE COMPANY IN THIS**
11 **PROCEEDING?**

12 **A. The Company's requested capital structure is shown on page 1 of DOD 205 attached to**
13 **this testimony and is taken from Mr. Von Gnetchen's Direct Testimony, Exhibit HECO-**
14 **2101 (Updated at 5/5/05). That capital structure consists of 55.30% common equity, 1.76%**
15 **preferred stock, 2.35% hybrid preferred securities, 36.49% long-term debt, 0.87% Lease**
16 **Obligations, and 3.22% short-term debt.**

17
18 **Q. IS THAT CAPITAL STRUCTURE SIMILAR TO THE MANNER IN WHICH HECO**
19 **HAS BEEN CAPITALIZED OVER THE PAST SEVERAL YEARS?**

20 **A. No. The Company's requested capital structure contains a higher percentage of common**
21 **equity and a lower percentage of debt capital than the Company has actually utilized over the**
22 **past five years. As shown on page 2 of DOD 205, the equity capital portion of HECO's**
23 **capital structure has increased from about 47% of total capital in 2000 to 53.8% at year-end**
24 **2004, but at no time was the Company's year-end common equity ratio as high as that**
25 **which it requests in this proceeding.**

26 **Because common equity, on a pre-tax ratemaking basis is about twice as costly as**
27 **debt capital, the Company's requested capital structure will be substantially more costly**
28 **than the capital structure with which it has been capitalized in the past. For example,**
29 **Company exhibits HECO-1901 and 1902 indicate that, HECO estimates its jurisdictional**

1 rate base to be approximately \$1.1 Billion. Assuming the Company were awarded its
2 requested 11.5% ROE, the additional 1.50% common equity HECO is requesting in this
3 proceeding over the amount outstanding at the end of 2004 [55.30% (requested) less
4 53.80% (2004)] would cost Hawaii ratepayers and additional \$3 Million per year. [\$1.1
5 Billion Rate Base x 1.5% x 11.5% ÷ (1-40% tax rate) = \$3.162 Million]

6 As I've noted previously, in its last rate case, the Company was awarded a return to
7 be applied to a capital structure containing 48.8% common equity. Using the same
8 assumptions as above, the additional 6.5% of common equity capital, if approved in this
9 proceeding, will cost the Company's Oahu ratepayers an additional \$13.7 Million every
10 year rates set in this case are in effect. [\$1.1 Billion Rate Base x 6.5% x 11.5% ÷ (1-40%
11 tax rate) = \$13.704 Million]

12
13 **Q. IS THE CAPITAL STRUCTURE REQUESTED BY THE COMPANY IN THIS**
14 **PROCEEDING SIMILAR TO THE AVERAGE CAPITAL STRUCTURE IN THE**
15 **ELECTRIC INDUSTRY TODAY?**

16 **A.** No. The capital structure requested by HECO in this proceeding contains considerably
17 more common equity and less total debt (long- and short-term debt) than is used on average
18 in the electric industry today. DOD 205, page 3 shows common equity ratio as a percent of
19 total capital (i.e., including short-term debt) for the electric industry as published in the April
20 2005 edition of AUS (formerly C.A. Turner's) Utility Reports.

21 The average common equity ratio in the electric industry is 47%, and in the
22 combination gas and electric industry is 40%. Considering only companies that have an
23 "A" bond rating from at least one major rating agencies, the average common equity ratio
24 for the electric and combination electric and gas industry ranges from 44% to 47%. That
25 common equity ratio, for companies that have higher bond ratings than HECO is
26 substantially below the level of common equity requested by HECO in this proceeding.

27 It is also important to note that the 55.54% common equity ratio requested by
28 HECO in this proceeding is substantially above the average common equity ratio of any of
29 the similar-risk sample groups studied in this proceeding. As shown at the bottom of page 3

1 of DOD 205, the average common equity ratio of the sample group of companies studied in
2 my testimony (excluding HEI)¹³ is 48%. The average common equity ratio of Dr. Morin's
3 Moody's electric utility sample group is 43%. The average common equity ratio of Dr.
4 Morin's investment grade vertically integrated electric group is 43% and the average
5 common equity ratio of his gas sample group is 44%. By this objective measure, the capital
6 structure requested by HECO in this proceeding implies substantially lower financial risk
7 than that employed by the electric industry, generally, and by the sample group's used to
8 estimate the cost of equity in this proceeding.

9
10 **Q. DOESN'T THE COMPANY TESTIFY THAT IT NEEDS A HIGHER COMMON**
11 **EQUITY RATIO BECAUSE ITS PURCHASED POWER CONTRACTS ARE**
12 **TREATED AS ADDITIONAL DEBT BY THE BOND RATING AGENCIES?**

13 **A. Yes, that is the Company's position; and it is true that purchased power expenses are**
14 **considered by rating agencies as debt-like obligations. However, the companies in my**
15 **sample group on average spend more on purchased power expenses per dollar of revenue**
16 **than HECO, and those companies maintain a similar bond rating to HECO's with an**
17 **average common equity ratio of only 48%.**

18 HECO reports in its 2004 S.E.C. Form 10-K (p. 145), that purchased power
19 expenses were at a level that equaled 25.8% of revenues. Eight of the other nine companies
20 in my sample group provide enough detail regarding purchased power expenses to calculate
21 that their average purchased power expense is approximately 30% of their 2004 electric
22 revenues. Therefore, those companies have, by that measure, greater purchased power risk
23 than HECO and are capitalized more economically (less expensively), i.e., with considerably
24 less common equity and more debt than HECO. Moreover, their average bond rating is
25 "BBB/BBB+", while HECO's is slightly higher at "BBB+."

26

¹³ AUS Utility Reports includes bank debt in its reporting of HEI's common equity ratio. Therefore, that equity ratio was excluded from the averages in order to compare the other utility equity ratios to that requested by HECO in this proceeding.

1 Q. IN IT'S UPDATED CAPITAL STRUCTURE, THE COMPANY INCLUDES A LEASE
2 OBLIGATION IN ITS RATEMAKING CAPITAL STRUCTURE THAT IT DID NOT
3 INCLUDE IN IT'S ORIGINAL FILING. HAVE YOU INCLUDED THAT LEASE IN
4 THE COMPANY'S RATEMAKING CAPITAL STRUCTURE?

5 A. No, I have not included that capital structure in the ratemaking capital structure because, in
6 the opinion of the DOD revenue requirements witness Mr. Ralph Smith, that lease was not
7 determined to be an operating lease and should not be included in rate base in this
8 proceeding. Absent the inclusion of that lease and considering all the other capital amounts
9 requested by the Company, the Company's ratemaking capital structure consists of 55.79%
10 common equity, 1.78% preferred stock, 2.37% hybrid securities, 36.81% long-term debt
11 and 3.25% short-term debt. That capital structure is shown on page 4 of Exhibit 205.

12 Elimination of the Company's Lease Obligation slightly increases the amount of
13 common equity capital in the Company's capital structure. I will use that capital structure
14 absent the lease, for ratemaking purposes in this proceeding.
15

16 Q. WHAT ARE THE RATEMAKING OPTIONS AVAILABLE TO REGULATORS
17 WHEN A COMPANY IS USING A COMMON EQUITY RATIO THAT IS HIGHER
18 THAN THAT OF OTHERWISE SIMILAR-RISK COMPANIES?

19 A. When a regulated firm is capitalized with more (less) common equity and less (more) debt
20 than otherwise similar-risk firms, in order to address that lower (higher) risk in the
21 ratesetting process, the regulatory body can impute a ratemaking capital structure that is
22 similar to that used by the sample group used to determine the cost of equity capital. In this
23 instance, a ratemaking capital structure containing about 48% to 50% common equity would
24 be more reasonable than the 55.8% utilized by HECO. In that situation, however, the
25 determination of the embedded debt costs could be problematic. Another alternative is to use
26 the requested capital structure, which in the instant case imparts lower financial risk to the
27 Company than that realized by the sample group used to estimate the cost of equity, and to
28 adjust the cost of equity estimate to account for that lower financial risk.
29

1 Q. IS THERE A RECOGNIZED METHOD WITH WHICH DIFFERENCES IN
2 FINANCIAL RISK CAN BE QUANTIFIED?

3 A. Yes. The cost of equity capital is affected by the capital structure a company employs.
4 When a company increases the proportion of debt in its capital structure, it increases the
5 riskiness of its equity. Financial risk (created by the use of debt in the capital structure)
6 causes investors to demand a higher rate of return; that is, financial risk increases the cost of
7 equity capital. Conversely, reducing financial risk (raising the equity ratio/lowering the debt
8 ratio) lowers the cost of equity.

9 The impact of debt leverage on the cost of equity capital can be approximated
10 through an examination of the changes in beta, which occur when leverage is increased or
11 decreased. The Value Line betas for the sample companies, i.e., the betas which are
12 calculated from a comparison of the individual return volatility of one stock versus that of a
13 market index (referred to in this analysis as the "measured" betas), reflect the market's
14 (investors') perception of both the business risks and the financial risks of a firm. That is,
15 one portion of the measured beta of a firm is related to the business risk of the firm (the risk
16 inherent in its operations) and one portion of the measured beta is related to the financial
17 risk of that firm (the risk associated with the use of debt). Therefore, if a firm elects to
18 finance its operations with debt as well as equity, the measured beta coefficient of that firm
19 will reflect both the business and financial risk. When a firm uses debt to finance its
20 operations, the measured beta can also be referred to as a "levered" beta (i.e., a beta
21 coefficient that includes the impact of debt leverage).

22 The average measured beta coefficient of the sample group of utilities can be
23 "unlevered." That is, the beta-risk related to the level of debt capital used by the firm can be
24 removed. "Unlevering the betas" amounts to estimating what the firm's beta would be if it
25 were financed entirely with equity capital. Equation (1) is used to estimate the unlevered beta
26 for a firm¹⁴.

¹⁴Equation (9) is a version of the Hamada equation which combines the Miller-Modigliani theories regarding capital structure and the logic of the CAPM: Hamada, R.S., "Portfolio Analysis, Market equilibrium and Corporation Finance," *Journal of Finance*, March 1969, pp. 13-31.

$$\beta_U = \frac{\beta_{\text{Measured}}}{(1 + (1 - t)D/E)} \quad (1)$$

Equation (1) indicates that an estimate of the unlevered beta (β_U) of a firm can be calculated by dividing the measured beta (β_{Measured} , e.g. the beta coefficient reported by investor services such as Value Line) by one plus the average debt-to-equity ratio, adjusted to account for taxes. The debt-to-equity ratio is measured using the average market value of the sample group equity capital. Once the unlevered beta for the firm (or, in this case, for the sample group of market-traded electric companies) is calculated, the beta coefficient is “re-levered” and adjusted to conform to the ratemaking capital structure. In this instance, the ratemaking capital structure is that requested by HECO in this proceeding (55.79% common equity capital). The formula used to “re-lever” the electric utility betas is shown below.

$$\beta_{\text{Relevered}} = \beta_U (1 + (1 - t)D/E) \quad (2)$$

Equation (2) states that the relevered beta equals the unlevered beta (β_U) multiplied times one plus the target debt-to-equity ratio (in this case HECO’s requested capital structure), again adjusted for taxes.

Page 5 of DOD 205 shows that, considering preferred stock and short-term debt as debt capital¹⁵, the average capital structure of the sample group of electric utility companies used in my testimony to estimate the cost of equity (excluding HEI) consists of 48% common equity and 52% debt. That capital structure, adjusted to market levels by an average 1.52 market-to-book ratio and accounting for a 35% tax rate, produces a value for $(1 - t)D/E$ in Equation 1 of 0.48.

DOD 205, page 5 shows further that the measured (average Value Line) beta coefficient of the sample group of electric firms is 0.79, and the unlevered beta coefficient of

¹⁵The “deleveraging” analysis could be extended to take account of each form of fixed income capital (e.g. preferred stock), but impact on the cost of equity capital would be essentially the same. Also, in considering the impact of debt leverage on the cost of capital all debt, including short-term debt, should be considered.

1 those firms is 0.53. When that beta is “relevered” using the methodology described above
2 to conform to HECO’s ratemaking capital structure, the resulting average beta coefficient is
3 0.72, a reduction in beta of 0.07 due to the Company’s high-equity ratemaking
4 capitalization [“measured” beta of 0.79 less “relevered” beta of 0.72].

5 Finally, with the reduction in beta determined, the CAPM can be used to estimate the
6 impact of that adjustment on the cost of capital. A review of the CAPM equation (Equation
7 (i) in DOD 203) indicates that the beta coefficient is multiplied by the market risk premium
8 ($r_m - r_f$) as a step in the determination of the cost of capital. Therefore, it is possible to
9 measure the impact of an adjustment to beta by multiplying the difference in the measured
10 and relevered betas of the electric companies by the market risk premium. As I note in my
11 discussion of the CAPM analysis, a reasonable estimate of the market risk premium—5%
12 to 6.6%—is provided by Ibbotson Associates. As shown in DOD 205, page 5, a reduction
13 in the average beta coefficient of 0.07, when adjusted to conform to the Company’s
14 requested capital structure, indicates a reduction in the cost of capital of from 37 to 49 basis
15 points ($0.07 \times 5\% \text{ to } 6.6\%$). Therefore, an estimate of the cost of equity impact of HECO’s
16 requested equity-rich capital structure is about 43 basis points (the mid-point of that range).
17 If the market risk premium is lower than that predicted by Ibbotson Associates (say, 3% to
18 4.5%), the analysis above would imply a cost of equity reduction of 21 to 30 basis points
19 for HECO.

20 There are problems with the accuracy of beta as well as the determination of the
21 market risk premium (which I discuss in some detail in DOD 203) and, for that reason, it
22 would not be reasonable to rely precisely on the result derived above. Nevertheless, the
23 analysis indicates that that because of HECO’s very high common equity ratio, the rate of
24 return allowed the Company in this proceeding should be below the mid-point of any range
25 of returns established using the market data of firms that have substantially more debt
26 leverage than the Company. Given that both my sample group and the sample groups
27 studied by Dr. Morin have more debt and less equity capital than HECO, setting an allowed
28 return for HECO below the mid-point of the range appropriate for the sample companies is
29 appropriate, given the differences in financial risk.

III. METHODS OF EQUITY COST EVALUATION

A. DISCOUNTED CASH FLOW MODEL

Q. PLEASE DESCRIBE THE DISCOUNTED CASH FLOW (DCF) MODEL YOU USED TO ARRIVE AT AN ESTIMATE OF THE COST RATE OF COMMON EQUITY CAPITAL FOR HECO IN THIS PROCEEDING.

A. The DCF model relies on the equivalence of the market price of the stock (P) with the present value of the cash flows investors expect from the stock, providing the discount rate equals the cost of capital. The total return to the investor, which equals the required return according to this theory, is the sum of the dividend yield and the expected growth rate in the dividend.

The theory is represented by the equation,

$$k = D/P + g, \quad (3)$$

where "k" is the equity capitalization rate (cost of equity, required return), "D/P" is the dividend yield (dividend divided by the stock price) and "g" is the expected sustainable growth rate.

Q. WHAT GROWTH RATE (g) DID YOU ADOPT IN DEVELOPING YOUR DCF COST OF COMMON EQUITY FOR THE COMPANY IN THIS PROCEEDING?

A. The growth rate variable in the traditional DCF model is quantified theoretically as the dividend growth rate investors expect to continue into the indefinite future. The DCF model is actually derived by 1) considering the dividend a growing perpetuity, that is, a payment to the stockholder which grows at a constant rate indefinitely, and 2) calculating the present value (the current stock price) of that perpetuity. The model also assumes that the company whose equity cost is to be measured exists in a steady state environment, i.e., the payout ratio and the expected return are constant and the earnings, dividends, book value and stock

1 price all grow at the same rate, forever. As with all mathematical models of real-world
2 phenomena, the DCF theory does not exactly "track" reality. Payout ratios and expected
3 equity returns do change over time. Therefore, in order to properly apply the DCF model to
4 any real-world situation and, in this case, to find the long-term sustainable growth rate called
5 for in the DCF theory, it is essential to understand the determinants of long-run expected
6 dividend growth.

7
8 **Q. CAN YOU PROVIDE AN EXAMPLE TO ILLUSTRATE THE DETERMINANTS OF**
9 **LONG-RUN EXPECTED DIVIDEND GROWTH?**

10 **A. Yes, in DOD 201, I provide an example of the determinants of a sustainable growth rate on**
11 **which to base a reliable DCF estimate. In addition, in DOD 201, I show how reliance on**
12 **earnings or dividend growth rates alone, i.e., absent an examination of the underlying**
13 **determinants of long-run dividend growth, can produce inaccurate DCF results.**

14
15 **Q. DID YOU USE A SUSTAINABLE GROWTH RATE APPROACH IN ADDITION TO**
16 **OTHER METHODS TO DEVELOP AN ESTIMATE OF THE EXPECTED GROWTH**
17 **RATE FOR THE DCF MODEL?**

18 **A. Yes. I have calculated both the historical and projected sustainable growth rate for a sample**
19 **of electric utility firms with similar-risk operations. However, I have not relied exclusively**
20 **on that type of growth rate analysis. In addition to the sustainable growth rate analysis, I**
21 **have also analyzed published data regarding both historical and projected growth rates in**
22 **earnings, dividends, and book value for a sample group of electric utility companies.**
23 **Through an examination of those data, which are available to and used by investors, I am**
24 **able to estimate investors' long-term growth rate expectations. To that long-term growth rate**
25 **estimate, I add any additional growth that is attributable to investors' expectations regarding**
26 **the on-going sale of stock for each of the companies under review.**

27
28 **Q. WHY HAVE YOU USED THE TECHNIQUE OF ANALYZING THE MARKET DATA**
29 **OF SEVERAL COMPANIES?**

1 A. I have used the "similar sample group" approach to cost of capital analysis because it
2 yields a more accurate determination of the cost of equity capital than does the analysis of
3 the data of one individual company. Any form of analysis, in which the result is an estimate,
4 such as growth in the DCF model, is subject to measurement error, i.e., error induced by the
5 measurement of a particular parameter or by variations in the estimate of the technique
6 chosen. When the technique is applied to only one observation (e.g., estimating the DCF
7 growth rate for a single company) the estimate is referred to, statistically, as having "zero
8 degrees of freedom." This means, simply, that there is no way of knowing if any observed
9 change in the growth rate estimate is due to measurement error or to an actual change in the
10 cost of capital. The degrees of freedom can be increased and exposure to measurement error
11 reduced by applying any given estimation technique to a sample of companies rather than
12 one single company. Therefore, by analyzing a group of firms with similar characteristics,
13 the estimated value (the growth rate and the resultant cost of capital) is more likely to equal
14 the "true" value for that type of operation.

15

16 Q. HOW WERE THE FIRMS SELECTED FOR YOUR ANALYSIS?

17 A. In selecting a sample of electric firms to analyze, I screened all the electric utility firms
18 followed by Value Line. I selected companies from that group that had a continuous
19 financial history and had at least 70% of operating revenues generated by electric utility
20 operations. In addition, I eliminated companies that were in the process of merging or being
21 acquired and had realized an upward stock price shift due to that activity or companies that
22 had recently cut or omitted dividends. Also, the companies in the selected sample had to
23 have a bond rating from one major rating agency ranging from "BBB-" to "BBB+"¹⁶,
24 generation assets, and a stable book value. I have eliminated from consideration companies
25 that are only "wires" companies, which have less operational risk than fully-integrated
26 electrics, in order to properly match the risk of the sample group with HECO. The sample
27 group selection screening process I utilized is shown in detail on DOD 206 attached to this
28 testimony.

¹⁶ HECO's bonds are rated BBB+ by Standard & Poor's.

1 Ten electric utilities passed the screening process. The companies included in the
2 sample group are: Central Vermont Public Service (CV), FirstEnergy Corp. (FE), Progress
3 Energy (PGN), Cinergy Corp. (CIN), Cleco Corp. (CNL), Empire District Electric (EDE),
4 Entergy Corp. (ETR), Hawaiian Electric Industries (HE), PNM Resources (PNM), and
5 Pinnacle West Capital Corporation (PNW). [Note: In the Exhibits accompanying this
6 testimony, the sample group companies are referred to by their stock ticker symbols,
7 designated above in parentheses.]
8

9 **Q. WHY HAVE YOU ELECTED TO INCLUDE HECO's PARENT COMPANY,**
10 **HAWAIIAN ELECTRIC INDUSTRIES IN YOUR SAMPLE GROUP?**

11 **A.** First of all, the parent company passed my screen, with revenues from electric operations
12 greater than 70% of total revenues. While it is my understanding that this Commission has,
13 in the past elected not to rely on the market data of the parent company to determine the cost
14 of equity of its regulated electric operations, I believe that action was taken to prevent the
15 higher risk of HE's unregulated banking operations from affecting the return allowed the
16 regulated utility operations at issue. While I agree with the assessment that, overall, the
17 consolidated parent company operations contain somewhat greater operational risk than the
18 utility operations alone, I do not believe that additional risk is enough to eliminate HE as a
19 sample group company. To the extent that the parent company consolidated operations
20 carry greater investment risk than HECO alone, my equity cost estimate should be viewed as
21 conservative, but I do not believe that HE should be excluded from a similar-risk sample
22 group.
23

24 **Q. HAS YOUR SELECTION PROCESS PRODUCED A SAMPLE GROUP THAT IS**
25 **SIMILAR IN RISK TO HECO?**

26 **A.** Yes, according to objective measures of investment risk, the risk of the sample group is
27 similar to that of HECO and, thus, will provide conservative estimate of the Company's cost
28 of common equity capital. For example, Standard & Poor's recently revised its published

1 bond rating benchmarks and its business position (business risk) rankings¹⁷. HECO's
2 business position is 6 on a scale of 1 through 10 (1 being lowest risk and 10 being the
3 highest). The average business position of my sample group of electric utilities is also 6.
4 According to S&P's business position ranking, then, the sample group has similar business
5 risk to HECO.

6 HECO's medium term bond rating is "BBB+" by Standard & Poor's, which is
7 similar to the average S&P bond rating of the sample group, which falls between "BBB"
8 and "BBB+". In sum, objective indicators imply that the investment risk of the sample
9 group is similar to that of HECO.

10 In addition, the companies included in my sample group have similar purchased
11 power risk to HECO. The Company reports in its 2004 S.E.C. Form 10-K (p. 145), that
12 purchased power expenses were at a level that equaled 25.8% of operating revenues. Eight
13 of the other nine companies in my sample group provide enough detail regarding purchased
14 power expenses to calculate that their average purchased power expense is approximately
15 30% of their 2004 electric revenues¹⁸. Therefore, it is reasonable to believe that HECO does
16 not have substantially greater purchased power risk than the sample group.

17 Finally, six of the other nine companies in my sample group have nuclear generation
18 assets in rate base. Due to the nature of that generation technology, it carries a higher risk
19 factor for investors. While HECO certainly has unique aspects to its generation mix (e.g.,
20 primarily oil-fired, no inter-island transmission interconnections), it does not face the risk of
21 nuclear generation, and could be considered less risky in that regard.

22
23 **Q. HOW HAVE YOU CALCULATED THE DCF GROWTH RATES FOR THE SAMPLE**
24 **OF COMPARABLE COMPANIES?**

25 **A. DOD 207 pages 1 through 4, shows the retention ratios, equity returns, sustainable growth**
26 **rates, book values per share and number of shares outstanding for the comparable**

¹⁷ Standard & Poor's Ratings Direct, "New Business Profile Scores Assigned for US Utility and Power Companies; Financial Guidelines Revised," June 2, 2004.

¹⁸ The other sample group company, Cinergy incurs purchased power expenses but does not separate those expenses from fuel and other electric generation expenses on their income statement, and, therefore, it is not possible to calculate a ratio of purchased power costs to revenues for that company.

1 companies for the past five years. Also included in the information presented in DOD 207,
2 are Value Line's projected 2005, 2006 and 2008-2010 values for equity return, retention
3 ratio, book value growth rates and number of shares outstanding¹⁹.

4 In evaluating these data, I first calculate the five-year average sustainable growth rate,
5 which is the product of the earned return on equity (r) and the ratio of earnings retained
6 within the firm (b). For example, DOD 207, page 3, shows that the five-year average
7 sustainable growth rate for HECO's parent company Hawaiian Electric Industries (HE) is
8 about 2%. The simple five-year average sustainable growth value is used as a benchmark
9 against which I measure the company's most recent growth rate trends. Recent growth rate
10 trends are more investor-influencing than are simple historical averages. Continuing to
11 focus on HE, we see that sustainable growth in 2001-2003 averaged 2.5%—above the
12 average growth for the five-year period, indicating an increasing trend in growth. Over the
13 next three- to five-year period, Value Line projects HE's sustainable growth will rise above
14 the recent five-year average to about 4%. These data would indicate that investors expect HE
15 to grow at a rate in the future above the growth rate that has existed, on average, over the past
16 five years²⁰.

17 It is important to note that, while the five-year projections are given consideration in
18 estimating a proper growth rate because they are available to and are used by investors, they
19 are not given sole consideration. Without reviewing all the growth rate data available to
20 investors, both projected and historic, sole reliance on projected information may be
21 misleading. Value Line readily acknowledges to its subscribers the subjectivity necessarily
22 present in estimates of the future:

23 We have greater confidence in our year-ahead ranking
24 system, which is based on proven price and earnings
25 momentum, than in 3- to 5-year projections. (Value Line
26 Investment Survey, Selection and Opinion, June 7, 1991,
27

¹⁹ Due to timing differences of Value Line's weekly publications, some of the companies under review have projections to the 2007-2009 period rather than the 2008-2010 period.

²⁰ I have included the details of my growth rate analyses for Hawaiian Electric Industries as an example of the methodology I use in determining the DCF growth rate for each company in the industry sample. A description of the growth rate analyses of each of the companies included in my sample group is set out in DOD 202, DOD 207, page 1, of Exhibit (SGH-1) attached to this testimony shows the internal, external and resultant overall growth rates for all the companies analyzed.

1 p.854).

2
3 Another factor investors consider is that HE's book value growth is also expected to
4 increase in the future. Growing at a 1.5% level over the past five years, book value is
5 projected to increase at a 3.5% rate in the future. That rate also indicates that investors
6 expect HE to grow at a more rapid rate in the future than the past, however that projected
7 growth rate is below the sustainable growth rate projection, moderating long-term growth
8 expectations to some degree.

9 Also, as shown on DOD 208, page 2, HE's dividend growth rate, which was 0.5%,
10 is expected to increase to a 1.0% rate in the future. This confirms that future growth is likely
11 to be higher than historical growth, however, that growth rate projection would tend to
12 moderate long-term growth rate expectations. Earnings growth rate data available from
13 Value Line indicate that investors can expect a higher growth rate in the future (4%) than
14 has existed over the past five years (3%). Also, First Call and Zack's (investor advisory
15 services that poll institutional analysts for growth earnings rate projections) project earnings
16 growth rate for HE over the next five years at a rate below Value Line's sustainable growth
17 forecasts—2.5% to 3.8%, respectively.

18 HE's projected sustainable growth, book value, dividend and projected earnings
19 growth indicates that investors can expect higher growth than has occurred, on average, in
20 the past. A long-term sustainable growth rate of 3.5% is a reasonable expectation for HE.

21
22 Q. IS THE INTERNAL ($b \times r$) GROWTH RATE THE FINAL GROWTH RATE YOU USE
23 IN YOUR DCF ANALYSIS?

24 A. No. An investor's sustainable growth rate analysis does not end upon the determination of
25 an internal growth rate from earnings retention. Investor expectations regarding growth
26 from external sources (sales of stock) must also be considered and examined. For HE, page
27 3 of DOD 207 shows that the number of outstanding shares increased at about a 4% rate
28 over the most recent five-year period. Value Line expects the number of shares outstanding
29 to increase at a 1.26% rate through the 2007-2009 period. However, Value Line expects the

1 number of shares outstanding at HE to remain stable (i.e., show 0% growth after 2004). An
2 expectation of annual share growth of 1.75% is reasonable for this company.

3 In addition, the current market price of HE is well above its book value. As I noted
4 previously a utility market price significantly above book value indicates that the utility is
5 earning a return in excess of its cost of capital. If the external ("sv") portion of the
6 sustainable growth rate is estimated using a market-to-book ratio that is indicative of over-
7 earnings, then the growth rate will be effectively based on an expectation of perpetual over-
8 earnings and, thus, overstated. If that expected DCF growth rate, predicated on the
9 expectation of over-earning the cost of capital, is used to set the allowed return the process
10 becomes cyclical, leading to higher and higher allowed returns.

11 Also, because a goal of regulation is to duplicate the strictures of the competitive
12 marketplace and, in so doing, to allow a utility to recover no more than its cost of capital, it is
13 reasonable to assume that the market price/book value ratio would have a tendency toward
14 unity over the long-term in order to mitigate the impact of over-earning on the projected
15 external growth rate.

16 Finally, although I have selected firms for analysis which derive at least 70% of their
17 revenues from electric operations, those firms are not "pure play" utilities—they do have
18 some other operations. That is certainly true for Hawaiian Electric Industries, with its
19 banking operations. Those other operations, therefore, are likely to have an upward impact
20 on the market price and the market-to-book ratio of those companies.

21 Therefore, a reasonable estimate of investors' expectations for utility price/book
22 ratios is that it will range between current levels and 1.0. For the companies in the sample
23 group that have growth expectations related to the increase in the number of shares
24 outstanding, I have used the average as an estimate of investors' expectations for the future.

25 At the time of this analysis, HE's market price is 176% of its book value ($M/B =$
26 1.76). The result of combining expected long-term growth for that company (3.50%) and
27 external growth due to increase in the number of shares outstanding (1.75%), yields an
28 investor-expected long-term growth rate of 4.17% (see DOD 208, page 1 of 2).

1 Q. HAVE YOU CHECKED THE REASONABLENESS OF YOUR GROWTH RATE
2 ESTIMATES AGAINST OTHER, PUBLICLY AVAILABLE, GROWTH RATE DATA?

3 A. Yes. Page 2 of DOD 208 shows the results of my DCF growth rate analysis as well as 5-
4 year historic and projected earnings, dividends and book value growth rates from Value
5 Line, earnings growth rate projections from First Call (and Zack's), the average of Value
6 Line and First Call growth rates and the 5-year historical compound growth rates for
7 earnings, dividends and book value for each company under study.

8 For the electric utility sample group, DOD 208, page 2, shows that my DCF growth
9 rate estimate for those companies is 4.84%. That long-term growth rate estimate is
10 significantly higher than Value Line's average projected earnings, dividend, and book value
11 growth rate (3.68%) for those same companies and also much higher than the historical
12 average of those same fundamental parameters (3.32%). In addition, my DCF growth rate
13 estimate for the electric companies is higher than First Call's, Value Line, and Zack's
14 projected earnings growth rate estimate (4.02%, 3.95%, 4.70% respectively). Given the
15 weight of the evidence available to investors, my DCF growth rates for these companies may
16 be conservative (i.e., on the high side), when compared to that published information.

17

18 Q. DOES THIS CONCLUDE THE GROWTH RATE PORTION OF YOUR DCF
19 ANALYSIS?

20 A. Yes, it does.

21

22 Q. HOW HAVE YOU CALCULATED THE DIVIDEND YIELDS?

23 A. I have estimated the next quarterly dividend payment of each firm analyzed and annualized
24 them for use in determining the dividend yield. If the quarterly dividend of any company
25 was expected to be raised in the quarter following that in which the most recent dividend
26 was declared, I increased the current quarterly dividend by $(1+g)$. For the utility companies
27 in the sample group, a dividend adjustment was unnecessary for most of the companies
28 under study because they either recently raised their dividend or were not projected to raise
29 the dividend in 2005. A dividend adjustment was required for only one company in the

1 sample, Central Vermont Public Service.

2 The next quarter annualized dividends were divided by a recent daily closing average
3 stock price to obtain the DCF dividend yields. I use the most recent six-week period to
4 determine an average stock price in a DCF cost of equity determination because I believe
5 that period of time is long enough to avoid daily fluctuations and recent enough so that the
6 stock price captured during the study period is representative of current investor
7 expectations.

8 DOD 209 indicates that the average dividend yield for the sample group of electric
9 utility companies is 4.36%. Value Line's most recent year-ahead dividend yield projection
10 for the companies in my sample group averaged 4.40%—slightly higher than the dividend
11 yield I use in my analysis (Value Line, *Summary & Index*, April 8, 2005). That indicates
12 that the dividend yield used in my DCF analysis is representative of investor expectations.
13

14 **Q. WHAT IS YOUR COST OF EQUITY CAPITAL ESTIMATE FOR THE ELECTRIC**
15 **UTILITY COMPANIES, UTILIZING THE DCF MODEL?**

16 **A. DOD 210 shows that the average DCF cost of equity capital for the entire group of electric**
17 **utilities studied is 9.21%.**
18

19 **B. CORROBORATIVE EQUITY COST ESTIMATION METHODS**
20

21 **Q. IN ADDITION TO THE DCF, WHAT OTHER METHODS HAVE YOU USED TO**
22 **ESTIMATE THE COST OF EQUITY CAPITAL FOR HECO?**

23 **A. To support and temper the results of my DCF analysis, I have used three additional**
24 **econometric methods to estimate the cost of equity capital for a group of firms similar in**
25 **investment risk to HECO. The three methodologies are: 1) the Capital Asset Pricing Model**
26 **(CAPM), 2) the Modified Earnings-Price Ratio (MEPR) analysis, and 3) the Market-to-**
27 **Book Ratio (MTB) analysis. The similar risk sample group of firms analyzed with these**
28 **three methods is the same as that selected for the DCF analysis, discussed previously. The**
29 **theoretical details of each of those analyses are contained in DOD 203, attached to this**

1 testimony. The actual calculations and data supporting the results of each of these models
2 are shown in the attached Exhibits.

3 Exhibit DOD 211 attached to this testimony shows the detail regarding the CAPM
4 analysis, which indicates a cost of capital for electric companies ranging from 7.99% to
5 9.91%. Exhibits 212 and 213 show the theoretical basis as well as the data and calculations
6 regarding the Modified Earnings Price Ratio (MEPR) analysis, which indicates a current
7 cost of equity capital for companies like HECO ranging from 8.61% to 8.66%. Exhibit
8 DOD 214 attached to this testimony contains the supporting detail for the Market-to-Book
9 Ratio (MTB) analysis, which indicates a current cost of equity capital of 9.13% (near-term)
10 to 8.92% (long-term).

11
12 **C. SUMMARY**

13
14 **Q. PLEASE SUMMARIZE THE RESULTS OF YOUR EQUITY CAPITAL COST**
15 **ANALYSES FOR THE SAMPLE GROUP OF SIMILAR-RISK ELECTRIC**
16 **COMPANIES.**

17 **A. My analysis of the cost of common equity capital for the sample group of electric utility**
18 **companies is summarized in the table below.**

19

<u>METHOD</u>	<u>COST OF EQUITY</u>
DCF	9.21%
CAPM	7.99%/9.91%
MEPR	8.61%/8.66%
MTB	9.13%/8.92%

20 The DCF result noted above, which is my primary indication of the cost of equity
21 capital, is 9.21%. Averaging the lowest and the highest results of the corroborative analyses
22 (CAPM, MEPR, and MTB) produces an equity cost rate range of 8.51% to 9.23%—a
23 range that includes DCF result at the upper end. The other corroborative analyses indicate

1 that my DCF results may overstate an accurate estimate of the cost of common equity of
2 electric utilities.

3 Given the results shown above, it would be reasonable to construct a current range
4 of equity capital costs with the DCF result at the upper end of that range. However, over the
5 next year or two capital costs may increase to some degree if the U.S. economy continues to
6 advance. Therefore, weighing all the evidence presented herein, I believe it is reasonable to
7 construct a current cost of equity range around the DCF estimate, and my best estimate of
8 the cost of equity capital for firms similar in risk to HECO is 8.75% to 9.50%. The mid-
9 point of that range is 9.125%.

10

11 Q. DOES YOUR EQUITY COST ESTIMATE INCLUDE AN INCREMENT FOR
12 FLOTATION COSTS?

13 A. No, it does not.

14

15 Q. CAN YOU PLEASE EXPLAIN WHY AN EXPLICIT ADJUSTMENT TO THE COST
16 OF EQUITY CAPITAL FOR FLOTATION COSTS IS UNNECESSARY?

17 A. An explicit adjustment to "account for" flotation costs is unnecessary for several reasons.

18 First, Dr. Morin notes at page 45 of his Direct Testimony that flotation costs associated
19 with common stock issues are "exactly" like flotation costs associated with bonds. As a
20 preliminary matter, that is not a correct statement because bonds have a fixed cost and
21 common stock does not. Moreover, even if it were true, the current relationship between the
22 electric utility sample group's stock price and its book value would indicate a reduction to
23 the market-based cost of equity, not an increase.

24 In response to DOD-IR-3-33, Dr. Morin correctly indicated that when a bond is
25 issued at a price that exceeds its face (book) value, and that difference between market price
26 and the book value is greater than the flotation costs incurred during the issuance, the
27 embedded cost of that debt (the cost to the company) is *lower* than the coupon rate of that
28 debt. In the current market environment for electric utility common stocks, those stocks are
29 selling at a market price 55% above book value. The difference between the market price of

1 electric utility stock and book value dwarfs any issuance expense the companies might
2 incur. Therefore, if common equity flotation costs are, as Dr. Morin testifies, "exactly like
3 flotation costs with bonds," then, the adjustment to the cost of common equity should be
4 downward, not upward.

5 Second, flotation cost adjustments are usually predicated on the prevention of the
6 dilution of stockholder investment. However, the reduction of the book value of stockholder
7 investment due to issuance expenses can occur only when the utility's stock is selling at a
8 market price at to or below its book value.

9 In the current market environment for electric utility common stock, the companies
10 under review are selling at a 54% premium to book value (see DOD 208, p. 1). Therefore,
11 every time a new share of that stock is sold, existing shareholders realize an *increase* in the
12 per share book value of their investment. No dilution occurs, even without any explicit
13 flotation cost allowance.

14 Third, the vast majority of the issuance expenses incurred in any public stock
15 offering are "underwriter's fees" or "discounts". Underwriter's discounts are not out-of-
16 pocket expenses for the issuing company. On a per share basis, they represent only the
17 difference between the price the underwriter receives from the public and the price the utility
18 receives from the underwriter for its stock. As a result, underwriter's fees are not an expense
19 incurred by the issuing utility and recovery of such "costs" should not be included in rates.

20 In addition, the amount of the underwriter's fees are prominently displayed on the
21 front page of every stock offering prospectus and, as a result, the investors who participate
22 in those offerings (e.g., brokerage firms) are quite aware that a portion of the price they pay
23 does not go to the company but goes, instead, to the underwriters. By electing to buy the
24 stock with that knowledge, those investors have effectively accounted for those issuance
25 costs in their risk-return framework by paying the offering price. Therefore, they do not
26 need any additional adjustments to the allowed return of the regulated firm to "account" for
27 those costs.

28 Fourth, my DCF growth rate analysis includes an upward adjustment to equity
29 capital costs which accounts for investor expectations regarding stock sales at market prices

1 in excess of book value, and any further explicit adjustment for issuance expenses related to
2 increases in stock outstanding is unnecessary.

3 Fifth, research has shown that a specific adjustment for issuance expenses is
4 unnecessary²¹. There are other transaction costs which, when properly considered, eliminate
5 the need for an explicit issuance expense adjustment to equity capital costs. The transaction
6 cost that is improperly ignored by the advocates of issuance expense adjustments is
7 brokerage fees. Issuance expenses occur with an initial issue of stock in a primary market
8 offering. Brokerage fees occur in the much larger secondary market where pre-existing
9 shares are traded daily. Brokerage fees tend to increase the price of the stock to the investor
10 to levels above that reported in the Wall Street Journal, i.e., the market price analysts use in a
11 DCF analysis. Therefore, if brokerage fees were included in a DCF cost of capital estimate
12 they would raise the effective market price, lower the dividend yield and lower the investors'
13 required return. If one considers transaction costs that, supposedly, raise the required return
14 (issuance expenses), then a symmetrical treatment would require that costs which lower the
15 required return (brokerage fees) should also be considered. As shown by the research noted
16 above, those transaction costs essentially offset each other and no specific equity capital cost
17 adjustment is warranted.

18
19 Q. WITHIN THE RANGE OF COMMON EQUITY COST YOU HAVE DETERMINED
20 TO BE APPROPRIATE FOR FULLY-INTEGRATED ELECTRICS, WHAT IS THE
21 APPROPRAITE POINT-ESTIMATE FOR HECO'S UTILITY OPERATIONS?

22 A. As I noted in Section II of my testimony. The companies in my sample group have similar
23 purchased power risk to HECO, but have a lower common equity ratio. Because of that fact,
24 an appropriate return for HECO should be below the mid-point of that appropriate for the
25 sample group of companies. The mid-point of my equity cost range for electric utilities
26 similar in risk to HECO is 9.125%. In this instance, a return of 9.0% for HECO is

²¹ "A Note on Transaction Costs and the Cost of Common Equity for a Public Utility," Habr, D.,
National Regulatory Research Institute Quarterly Bulletin, January 1988, pp. 95-103.

1 reasonable and, given the substantially lower financial risk afforded by the Company's
2 capital structure, should be considered conservative.

3
4 **Q. WHAT WOULD BE THE OVERALL COST OF CAPITAL FOR HECO'S ELECTRIC
5 AND GAS UTILITY OPERATIONS, BASED ON AN ALLOWED EQUITY RETURN
6 OF 9.0%?**

7 **A. Exhibit DOD 215 attached to my testimony shows that an equity return of 9.0%, operating
8 through the Company's requested ratemaking capital structure and the Company's forward-
9 looking capital cost rates, produces an overall return of 7.71% for HECO. DOD 215 also
10 shows that a 7.71% overall cost of capital affords the Company an opportunity to achieve a
11 pre-tax interest coverage level of 4.29 times.**

12 According to Standard & Poor's most recent bond rating benchmarks that included
13 pre-tax interest coverage data, a utility with a business position of 6, like HECO, could attain
14 an "A" bond rating with pre-tax interest coverages ranging from 4.0 to 5.2 times. The
15 equity return and capital structure I recommend offers the Company an opportunity to meet
16 that pre-tax interest coverage test and, thereby, maintain or improve its current bond rating.
17 Also, the equity return I recommend fulfills the legal requirement of Hope and Bluefield of
18 providing the Company the opportunity to earn a return which is commensurate with the
19 risk of the operation and serves to support and maintain the Company's ability to attract
20 capital.

21
22 **IV. COMPANY COST OF CAPITAL TESTIMONY**

23
24 **Q. HOW HAS DR. MORIN ESTIMATED THE COST OF EQUITY IN THIS
25 PROCEEDING?**

26 **A. Dr. Morin has analyzed the cost of equity capital for HECO using ten risk premium-type
27 analyses (four CAPM analyses, and six Risk Premium analyses)²² and six DCF analyses.**

²² At page 22, lines 10-14 of his Direct Testimony, Dr. Morin refers to his CAPM and Risk Premium studies as "the Risk Premium Method."

1 The results of those two types of methodologies are very different. The average equity cost
2 estimate of his ten risk premium analyses is 11.8%. The average DCF equity cost estimate
3 reported by Dr. Morin in this proceeding is 9.97%²³.

4 Because there are ten risk premium analyses and six DCF analyses, and because Dr.
5 Morin bases his recommendation on an average of all the methods, his recommendation is
6 skewed upward toward the higher risk premium results. If Dr. Morin had, over time,
7 consistently relied on risk premium-type equity cost estimates as the primary method with
8 which he estimated equity capital costs, his procedure in this proceeding would not be
9 problematic. However, that is not the case.

10 In prior testimony, Dr. Morin placed greater emphasis on DCF results, performing
11 more DCF analyses than risk premium analyses and, thereby, making the resulting equity
12 cost estimate more DCF-centric than offered here²⁴. In his published work regarding
13 estimating the cost of capital of utility operations, Dr. Morin focuses more on the DCF and
14 less on risk premium analyses.²⁵

15 Dr. Morin acknowledges in his Direct Testimony in this proceeding that the DCF is
16 “appropriate,” enjoys “broad usage,” and that some regulatory bodies place exclusive
17 reliance on the DCF to estimate equity capital costs. For example, during the 1980s and
18 early 1990s the Federal Energy Regulatory Commission instituted a generic determination
19 of the cost of equity capital for the electric utility industry. Following literally years of
20 comments and reply comments from many participants regarding different equity cost
21 estimation methods, the FERC selected the constant growth DCF model as the single best
22 method with which to estimate the cost of equity capital.²⁶ Also, a study of regulatory

²³ In his reported DCF results, Dr. Morin has elected to exclude many of the lower results produced by that analysis, while retaining the higher estimates. Absent flotation costs and an unnecessary adjustment to dividend yields, Dr. Morin’s DCF results average 9.5% $[(9.2\%+9.1\%+9.4\%+10.1\%+9.3\%+10.1\%)/6]$.

²⁴ For example, in a 2002 testimony Dr. Morin submitted on behalf of a gas distribution utility (Elizabethtown Gas), in which he used four risk premium analyses and four DCF analyses. Giving DCF and Risk Premium analyses equal weight in this proceeding, would produce an equity cost estimate of 10.88%—21 basis points below his 11.1% equity cost estimate in this proceeding.

²⁵ In the most recent edition of his text Morin, R., Regulatory Finance, Utilities’ Cost of Capital. Public Utilities Reports, Arlington, VA, 1994, Dr. Morin devotes five chapters to DCF theory and application and one chapter each to CAPM and Risk Premium methods.

²⁶ FERC anticipated that an administrative determination of an appropriate industry-wide cost of equity would limit debate on that issue in rate proceedings. It did not. Because FERC staff was devoting resources

1 commission equity cost estimation methods by the National Association of Regulatory
2 Utility Commissioners, found that while nearly every regulatory body in the U.S. and
3 Canada listed DCF as a methodology on which it relied, only 11 listed CAPM.²⁷ During
4 cross-examination in a recent rate gas in Georgia, Dr. Morin referenced that study and
5 noted that DCF use was "almost unanimous," while no Commission relied solely on the
6 CAPM. (Atlanta Gas Light Company, G.P.S.C., Docket No. 18638-U, Tr. 500—501).

7 However, in his testimony in this proceeding, Dr. Morin de-emphasizes his reliance
8 on the DCF, places his primary reliance on risk premium methods (ten out of his sixteen
9 analyses are risk premium analyses). Dr. Morin also elects to provide detail regarding the
10 enabling assumptions only for the DCF, making the claim that those assumptions,
11 somehow, conflict with the current investment environment for utilities.

12 Also, while devoting considerable testimony to the DCF assumptions and criticisms,
13 Dr. Morin neglects to discuss the theoretical assumptions and application problems of risk
14 premium methods, which are substantial. The difficulties with risk premium models that Dr.
15 Morin elects not to discuss are the very reason why those methodologies tend to be less
16 reliable indicators of the cost of equity capital than the DCF. Dr. Morin's testimony de-
17 emphasizes the most widely-used equity cost estimation technique, the DCF, which provides
18 the lower results, and emphasizes the results of more unreliable risk premium methods,
19 which provide higher equity cost estimates.

20
21 Q. PLEASE EXPLAIN WHY, CONTRARY TO DR. MORIN'S TESTIMONY, IT IS
22 REASONABLE TO BELIEVE THAT THE DCF IS A RELIABLE INDICATOR OF
23 EQUITY CAPITAL COSTS IN THE CURRENT CAPITAL MARKET
24 ENVIRONMENT.

25 A. At page 17 of his Direct Testimony, Dr. Morin opines that "several fundamental and
26 structural changes have transformed the energy utility industry since the standard DCF

to producing a generic cost of equity estimate and continuing to litigate the issue in every rate proceeding, the Commission ultimately discontinued the generic rulemaking proceeding.

²⁷ National Association of Regulatory Utility Commissioners, "Utility Regulatory Policy in the United States and Canada," Compilation 1994-1995.

1 model and its assumptions were developed.” While that is certainly true, it is also true for
2 all other market-based equity cost estimation methods such as the CAPM, which was
3 developed about the same time as the DCF (1960s and 1970s). Therefore, Dr. Morin cannot
4 credibly claim the DCF is flawed because it was developed during another economic era,
5 while simultaneously placing more weight on an econometric model developed at the same
6 time. Moreover, cost of equity methods do not model particular economic conditions, rather
7 they model the manner in which investors make decisions. Therefore, unless Dr. Morin can
8 show that the DCF is no longer a reasonable proxy for the manner in which investors value
9 stocks (i.e., if investors do not believe that the current stock price is the present value of the
10 future income stream generated by that stock)—and he has made no attempt to do so—his
11 claim that the DCF is unreliable is not supported.

12 Dr. Morin’s claim of DCF ineffectiveness fails on other grounds as well. The
13 energy industry has been in some sort of “turmoil” consistently for the past thirty years.
14 Just hitting the high points, we recall the oil embargo of the mid-1970s, a 21% prime rate in
15 the early 1980s, the enormous nuclear building program for electric utilities—made doubly
16 costly by the incident at Three Mile Island, the stock market crash of 1987, the gas
17 “bubble,” force majeure with the pipeline industry, stock prices well below book value,
18 dividend cuts, mergers and acquisitions, poorly performing unregulated investment, and the
19 beginnings of policy discussions regarding deregulation of the generation function. That list
20 of problems brings us only up through the mid-1990s. The DCF model was the pre-
21 eminent cost of equity estimation method used all during that time to set utility rates, and
22 Dr. Morin relied on that model during that time. The current “structural change” in the
23 utility industry is simply more of the same and, in and of itself, in no way signals the
24 unreliability of the DCF, as Dr. Morin suggests.

25 Regarding Dr. Morin’s logic that the DCF doesn’t fit the current
26 regulatory/investment environment for energy utilities, two other points should be noted.
27 First, the “sea changes” in the gas utility industry occurred some time ago with allowing
28 customers to transport gas in the mid-1980s (FERC Order 436) and the separation of the
29 merchant function from the pipeline function occurring in the early 1990s (FERC Order

1 636). Therefore, the gas distribution industry is structurally stable and has been so for some
2 time. I mention this only because Dr. Morin has elected to use gas distributors as similar-
3 risk proxies to HECO in this proceeding.

4 Second, it was certainly true, at some point in the late 1990s prior to the advent of
5 the deregulation of electric utility generation in some jurisdictions, that there was uncertainty
6 as to the direction of a portion of the industry that was subject to de-regulatory pressures.
7 However, following the California "experiment" and confessions of energy trading
8 malfeasance, the uncertainties pertaining to the deregulation of the electric utility industry
9 have been greatly reduced. The deregulation juggernaut has effectively ground to a halt with
10 some jurisdictions embracing that paradigm, while most have not.

11 Those jurisdictions that have deregulated have done so successfully, without the
12 attendant turmoil that occurred in California and have lowered uncertainty-related risks in
13 that regard. It is important to note that, at this point, the "structural changes" afoot in that
14 industry have been discounted in current stock prices by an efficient market and serve no
15 impediment to the accurate estimate of the cost of equity capital by the DCF. Certainly, the
16 current level of uncertainty regarding electric utilities is no worse than that which existed, for
17 example, during the extremely high interest rates and nuclear building programs of the early
18 1980s. Therefore, if the DCF provided accurate equity cost estimates in the 1970s, 1980s
19 and 1990s, and Dr. Morin's prior focus on that model indicates that he believed it did, it
20 does so today.

21
22 Q. HAS DR. MORIN TESTIFIED RECENTLY THAT THE DCF UNDERSTATES THE
23 COST OF EQUITY WHEN MARKET PRICES ARE ABOVE BOOK VALUE AND
24 OVERSTATES THE COST OF EQUITY WHEN MARKET PRICES ARE BELOW
25 BOOK VALUE?

26 A. Yes. While he has not provided that opinion thus far in this proceeding, he has testified to
27 that effect recently in his rebuttal testimony before the Georgia Public Service Commission
28 (Atlanta Gas Light, Docket No. 18638-U) and in direct testimony before the New

1 Hampshire Public Utilities Commission (Public Service Company of New Hampshire,
2 Docket No. DE-04-177).

3
4 Q. HAS THIS ALWAYS BEEN HIS POSITION?

5 A. No. Dr. Morin's first text on the cost of capital, Utilities' Cost of Capital, was published in
6 1984, and was, therefore, conceived and written during a difficult time period for electric
7 utilities in which interest rates were very high and market prices were generally below book
8 value. There is not one word in that text regarding the ability of the DCF to accurately
9 estimate the cost of equity depending on the market-to-book ratio of utilities. There is
10 certainly nothing in that text that indicates that when market prices are below book value (as
11 they were at that time), the DCF overstates the cost of equity (as is now Dr. Morin's claim).
12 At the end of four chapters in that 1984 text that discuss the DCF model in detail, in a
13 section entitled "Closing Comments On DCF," Dr. Morin states:

14
15 "The DCF method is firmly established as the standard
16 method of measuring the cost of capital in the vast majority
17 of corporate finance and investment textbooks, and is deeply
18 entrenched in regulatory practice. The method is widely used
19 by all parties in regulatory proceedings in most jurisdictions.
20 The method is solid conceptually, and controversy regarding
21 the method generally centers on implementation and
22 execution rather than on theoretical soundness.

23 ...
24 The DCF model produces a cost of equity predicated on
25 current conditions. Alternate conditions may produce higher
26 or lower growth rates, hence different equity cost estimates,
27 depending on investor reaction to the change in conditions as
28 manifested by the market price. Fortunately, the DCF model
29 possesses a built-in compensatory mechanism which
30 mitigates this problem; investor reactions to changes in
31 expected growth are accompanied by changes in market
32 prices which in turn alter the dividend yield in a direction
33 opposite to that of the revised growth rate. In other words, the
34 impact of any change in conditions on the dual components
35 of the DCF model are at least partially self-correcting."
36 (Morin, R. Utilities' Cost of Capital, Public Utilities Reports,
37 Inc., Arlington VA, 1984, pp. 167-168)

38
39 The DCF, as we know it today, was first introduced by Professor Myron Gordon in
40 the early 1960s and was not used in regulation prior to that time. Following its introduction,

1 it quickly became, as Dr. Morin noted above, "the standard method of measuring the cost
2 of capital." The theories and assumptions on which the model is based have not changed.
3 The magnitude of the economic "turmoil" faced by electric utilities today is arguably no
4 worse than that faced in the early 1980s with short-term debt costs at 20%, enormous
5 nuclear plant construction costs and a sluggish economy. Moreover, during that time period
6 in which utility market prices were below book value on average, Dr. Morin found no
7 structural problems with the DCF related to market price and book value. Yet, as market
8 prices have climbed above book value and DCF equity cost results have, appropriately,
9 declined along with the general level of capital costs, the DCF has developed a structural
10 flaw, according to Dr. Morin. This theoretical inconsistency regarding the fundamentals of
11 the DCF appears to be largely result-oriented, in my view, and makes Dr. Morin's current
12 testimony on that topic suspect.

13 Also, it is worth noting that Dr. Morin does not always feel compelled to offer his
14 "DCF understates when market prices are above book value" in his direct testimony.
15 However, in his direct testimony recently filed before the New Hampshire Public Utilities
16 Commission (N.H.P.U. C., Docket No. DE-04-177, Public Service Company of New
17 Hampshire), Dr. Morin does offer that testimony, and states, at page 56 of his testimony in
18 that proceeding, that the average, truncated average and median of his equity cost estimates
19 are 10.7%, 10.7% and 10.9%, respectively. Those more recent estimates regarding electric
20 utility equity costs are lower than he provides in his Direct Testimony in the instant
21 proceeding (11.1%). He also states in his New Hampshire testimony, "if we place slightly
22 less weight to the DCF results, the central result is 11.0%." He recommends 11.0% in that
23 proceeding, through an explicit de-emphasis on the DCF.

24 In his recent testimony on behalf of Atlanta Gas Light Company (G.P.S.C. Docket
25 No. 18638-U, Morin Direct, October 2004), Dr. Morin made no mention of the
26 DCF/market-to-book/understatement issue in his direct testimony, which mirrors his
27 testimony in the instant proceeding. Moreover, he analyzed the same groups of companies
28 in his recent testimony in Georgia that he analyzed in this proceeding (gas distributors and
29 two electric utility sample groups) and testified in that case that the average, truncated

average, and median result were 11.2%, 11.2% and 11.3%. He recommended an equity cost of 11.2%, weighing all analyses equally, again as he does in this case.

Therefore, not only are Dr. Morin's current statements regarding the efficacy of the DCF when market prices are different from book value inconsistent theoretically from his prior published position, they are inconsistent with testimony filed recently in another jurisdiction.

Q. CAN YOU EXPLAIN THE EXAMPLE DR. MORIN USES TO SUPPORT HIS LOGIC AGAINST RELIANCE ON HIS DCF RESULTS?

A. Yes. Dr. Morin, at pages 236 and 237 of his Regulatory Finance (op cit), sets out the following numerical example he sometimes uses in his testimony.

Dr. Morin's Market-to-Book Example

	Situation 1	Situation 2	Situation 3
1 Initial Purchase Price	\$25.00	\$50.00	\$100.00
2 Initial Book Value	\$50.00	\$50.00	\$50.00
3 Initial M/B	0.50	1.00	2.00
4 DCF Return 10% = 5% + 5%	10.00%	10.00%	10.00%
5 Dollar Return	\$5.00	\$5.00	\$5.00
6 Dollar Dividends 5% Yield	\$1.25	\$2.50	\$5.00
7 Dollar Growth 5% Growth	\$3.75	\$2.50	\$0.00
8 Market Return	20.00%	10.00%	5.00%

His explanation of the "impact" of market-to-book ratios on the DCF cost of equity in "Situation 3" (when market prices are above book value) proceeds as follows:

"The DCF cost rate of 10%, made up of a 5% dividend yield and a 5% growth rate, is applied to the book value rate base of \$50 to produce \$5.00 of earnings. Of the \$5.00 of earnings, the full \$5.00 are required for dividends to produce a dividend yield of 5% on a stock price of \$100.00, and no dollars are available for growth. The investor's return is therefore only 5% versus his required return of 10%. A DCF cost rate of 10%, which implies \$10.00 of earnings, translates to only \$5.00 of earnings on book value, or a 5%

1 return.” (Morin, R., Regulatory Finance, Utilities’ Cost of
2 Capital, Public Utilities Reports, Arlington VA, 1994, p. 236)

3
4 Dr. Morin continues in his text to discuss “Situation 1” in which market prices are below
5 book value and the DCF, supposedly overstates the cost of equity. Of course, as I noted
6 previously, during the time period when market prices were consistently below book value,
7 Dr. Morin expressed no concerns that the DCF was inaccurate when market price was
8 different from book value.

9
10 Q. ASIDE FROM THE LOGICAL INCONSISTENCIES INHERENT IN DR. MORIN’S
11 TESTIMONY REGARDING THE DCF AND MARKET-TO-BOOK RATIOS, DO
12 YOU HAVE ANY COMMENTS REGARDING THE NUMERICAL EXAMPLE SET
13 OUT ABOVE?

14 A. Yes. In attempting to show that the DCF estimates the cost of equity incorrectly when
15 market prices are different from book value, Dr. Morin has created a hypothetical situation
16 that cannot exist in reality and is contrary to one of the most fundamental precepts in
17 finance. For example, in attempting to show that the DCF understates the cost of capital
18 when market prices are above book value, Dr. Morin posits a firm that has an allowed return
19 of 10% (which is supposedly determined by the DCF), a book value of \$50 and for which
20 investors are paying a stock price equal to twice book value (\$100). That company will earn
21 \$5 on its rate base investment (10% allowed return x \$50 rate base/book value), and that \$5
22 return represents only a 5% return to the investors that paid \$100 for the stock. Dr. Morin,
23 through this example, ostensibly concludes that the DCF does not provide the investors’
24 required 10% return (the DCF-determined return) when it is applied to a rate base (book
25 value) that is smaller than the market price. This is wrong for two reasons.

26 First, referring to Dr. Morin’s “Situation 3” numerical example, if the investor’s
27 required return is actually 10% (which appears to be Dr. Morin’s assumption) and the
28 utility is expected to earn a 10% return on its book value of \$50, then no investor would pay
29 twice book value for that stock. Imagine a broker trying to sell a stock to an investor who
30 requires a 10% return. “I’ve got a stock for you that’s going to pay a 10% return on a \$50

1 per share book value—in other words one share will get you \$5, but each share will cost
2 you \$100. What do you say?" Any rational investor that required a 10% return to commit
3 funds to that type of investment would flatly refuse that offer. No investor would knowingly
4 pay \$100 for a stock that will earn \$5 when he or she requires a 10% return for that type of
5 stock. Dr. Morin's "example" defies fundamental financial logic.

6 Second, the only reason for an investor to pay \$100 for a stock that will provide a
7 \$5 income stream is if that investor requires a 5% return for that type of stock. In Dr.
8 Morin's example if we take the 10% number to be the allowed return (the expected return
9 on the \$50 rate base), and the investor's cost of capital to be 5% (a DCF result derived from
10 a 5% dividend yield and 0% growth), then his "Situation 3" numerical example makes
11 economic sense. If the investor's required return is 5% and the stock in question is
12 expected to pay a 10% return on a \$50 book value, then, *and only then*, is the \$100 stock
13 price rational.

14 Therefore, the only situation under which the numerical conditions set out in Dr.
15 Morin's example can exist is one that conforms with the widely accepted relationship
16 between market price, book value, ROE and the cost of capital discusses previously in my
17 testimony. Namely, when the expected return ($r = 10\%$ in "Situation 3," above) exceeds the
18 investors' required return ($K = 5\%$ in "Situation 3," above) the market price ($P = \$100$)
19 will exceed the book value ($B = \$50$).

20 In summary, Dr. Morin's numerical example that purports to show that the DCF
21 understates the cost of equity when market prices are different from book value does not do
22 so. Instead, under the only circumstance that makes economic sense, his example shows that
23 when utility market prices are significantly above book value, the investors' required return
24 (the cost of equity capital) is below the ROE expected to be earned by those companies. As
25 I've noted previously that long-standing truism indicates that Dr. Morin's recommended
26 equity return of 11.5% cannot be an accurate estimate of HECO's cost of equity capital.

1 Q. DR. MORIN DISCUSSES THE UNDERLYING ASSUMPTIONS OF THE DCF, BUT
2 PROVIDES NO INSIGHT INTO THE ASSUMPTIONS THAT UNDERLIE HIS RISK
3 PREMIUM METHODS. ARE THE ENABLING ASSUMPTIONS OF RISK
4 PREMIUM ALWAYS RESTRICTIVE?

5 A. Yes. The assumptions that enable the existence of the CAPM analysis are far more
6 restrictive than those that support the DCF. At page 15 of his Direct Testimony, Dr. Morin
7 references Dr. Eugene Brigham as a "widely respected scholar of finance academician."
8 Dr. Brigham provides a concise list of the assumptions that underlie the Capital Asset
9 Pricing Model:

- 10 1. All investors think in terms of a single period, and they
- 11 choose among alternative portfolio's expected return and
- 12 standard deviation over that period.
- 13 2. All investors can borrow or lend an unlimited amount of
- 14 money at a given risk-free rate of interest, k_{RF} , and there are
- 15 no restrictions on short sales of any asset.
- 16 3. All investors have identical estimates of the expected
- 17 values, standard deviations, and correlations of returns among
- 18 all assets; that is, investors have "homogeneous
- 19 expectations."
- 20 4. All assets are perfectly divisible and are perfectly
- 21 marketable at the going price.
- 22 5. There are no transaction costs.
- 23 6. There are no taxes.
- 24 7. All investors are price takers (that is, all investors assume
- 25 that their own buying and selling activity will not affect
- 26 market prices).
- 27 8. The quantities of all assets are given and fixed. (Brigham,
- 28 E. Gapenski, L., Intermediate Financial Management, 5th Ed.,
- 29 Dryden Press, Fort Worth TX, 1994, p. 68) (Staff Exhibit 4).
- 30

31
32 Those restrictive CAPM assumptions are also shown at page 319 of Dr. Morin's
33 Regulatory Finance, Utilities' Cost of Capital²⁸.

34 It should be clear, even to the most casual observer, that many of the assumptions on
35 which the CAPM is predicated are violated in applying the CAPM to the determination of

²⁸ In defense of his reliance on CAPM, Dr. Morin has recently argued that if the CAPM is considered to be a special case of the Arbitrage Pricing Model (APM), its assumptions are less restrictive. Unfortunately, although the APM has less restrictive assumptions, it was derived after the CAPM as an attempt to solve some of the CAPM's problems and does not negate the assumptions on which the CAPM rests. Further, Dr. Morin has relied on the CAPM, not the APM to estimate the cost of equity capital and reference to the latter to mollify the strict nature of the assumptions on which the CAPM rests is inappropriate.

1 the cost of capital of a particular type of security. All investors are not single-period
2 investors; all investors can't borrow and lend unlimited amounts of money at the risk-free
3 rate; all investors do not have identical return expectations. Furthermore, all assets are not
4 perfectly divisible; there are taxes; there are transaction costs; and many large institutional
5 investors are acutely aware that buying and selling large amounts of any particular stock
6 may affect stock prices. Each of these everyday stock market realities violates at least one of
7 the assumptions on which the CAPM is grounded.

8 There are broader theoretical questions regarding the CAPM that I discuss in some
9 detail in DOD 203 attached to this testimony. For example, while analysts commonly use a
10 broad market index (S&P 500 or NYSE) to represent "the market" in the CAPM, the
11 model is actually designed to consider all capital investments (bonds, art, real estate, human
12 capital) not just stocks. Moreover, since there is no "index" for all capital investments, the
13 "true" CAPM cost of equity is unknowable, technically speaking.

14 The CAPM also has problems with its primary risk measure beta, which are
15 discussed briefly in DOD 203. Although he fails to do so in his testimony in this
16 proceeding, Dr. Morin discussed many of the problems with beta in his 1994 text:

17
18 **Practical and Conceptual Difficulties**

19 **Computational Issues.** Absolute estimates of beta may
20 vary over a wide range when different computational methods
21 are used. The return data, the time period used, its duration,
22 the choice of market index, and whether annual, monthly, or
23 weekly return figures are used will influence the final result.

24 ---
25 **Beta Stability.** Several empirical studies of beta coefficients,
26 notably by Blume (1975) and Levy (1971), have revealed the
27 market instability of betas over time.

28 ---
29 **Historical versus True Beta.** The true beta of a security
30 can never be observed.

31 ---
32 **Relevance of Beta.** According to both financial theory and
33 empirical evidence, betas are critical and sufficient measures
34 of risk. For diversified investors, beta is the only relevant
35 measure of risk....But the basic issue of the relevance of beta
36 as the only measure of risk remains controversial. (Morin, R.
37 Regulatory Finance, Utilities' Cost of Capital, Public Utilities
38 Reports, Arlington VA, 1994, pp. 65-71)

1 In summary, the CAPM analysis used by Dr. Morin has very strong assumptions
2 that violate real-world financial market conditions. Also, the fundamental risk measure on
3 which CAPM is based (beta) has many problems—a fact discussed in detail by Dr. Morin
4 in his text. While the CAPM remains an elegant description of capital market behavior that
5 is widely used in academia as a theoretical framework, that model has significant application
6 problems. While those problems do not negate its use, they do call for the use of the CAPM
7 as a second-tier equity cost estimation procedure.

8
9 Q. DOESN'T DR. MORIN PROVIDE A QUOTE FROM "ONE OF THE LEADING
10 EXPERTS ON REGULATION" THAT DISCUSSES THE "DANGERS" OF
11 RELYING SOLELY ON THE DCF?

12 A. Yes, he does. However, Dr. Morin failed to provide the Commission the opinion of that
13 same "leading expert" regarding the CAPM, which follows immediately after the quote he
14 chose to cite in his testimony. At page 19 of his Direct Testimony, Dr. Morin quotes from
15 Dr. Charles Phillips' text The Regulation of Public Utilities Theory and Practice. The very
16 next paragraph following the cite provided by Dr. Morin reads as follows:

17
18 The CAPM holds that the cost of equity capital or expected
19 return on a utility's common equity is equivalent to that on a
20 riskless security plus a risk premium related to the risk
21 inherent in a particular utility's stock; that is, the model
22 combines risk and return in a single measure.

23 ---
24 Despite its appeal, the CAPM also has both theoretical and
25 practical problems. The theoretical issues include the
26 reliability of the model's basic assumptions and the static
27 nature of the model. The practical problems surround the
28 beta coefficient, "the only variable in the CAPM equation
29 that is unique to the particular firm for which the cost of
30 equity capital is being determined." They include: How
31 should beta be measured—stock market price alone or total
32 return on investment (i.e., dividends plus capital gains)?
33 What period of time should be used for such measurement?
34 What is the proper measure of stock market performance
35 (e.g., Dow Jones index, Standard & Poor's index, etc.)?
36 What is the proper measure of the risk-free return (e.g.
37 Treasury notes or Treasury bonds)? Finally, the evidence
38 suggests that betas are unstable over time and that they move
39 in the opposite direction from investors' perceptions of risk.
40 These issues have led some to conclude that the CAPM, at

1 least at this stage in its development, "is inaccurate,
2 incomplete, and unreliable as a measure of a firm's equity
3 cost of capital." (Phillips, C.F., The Regulation of Public
4 Utilities Theory and Practice, Public Utilities Reports,
5 Arlington VA, 1993, 396, 397, footnotes omitted) (Staff
6 Exhibit 5).

7
8 Q. DO YOU USE THE CAPM IN DETERMINING YOUR RECOMMENDATION IN
9 THIS PROCEEDING?

10 A. Yes, I do.

11
12 Q. PLEASE EXPLAIN HOW YOUR APPROACH DIFFERS FROM THAT OF DR.
13 MORIN.

14 A. While I agree with Dr. Phillips that the CAPM has its problems, I do use the model as one
15 of the methods to estimate the cost of equity. However, unlike Dr. Morin in this proceeding,
16 I do not place primary reliance on that model because of both the theoretical and practical
17 implementation problems associated with the CAPM. Moreover, it is important to
18 understand that the same "leading expert" Dr. Morin elects to quote in his attempt to
19 downplay the importance of DCF equity cost estimates, also indicates the CAPM is
20 "unreliable." Dr. Morin's election to cite only the negative information about the DCF,
21 while ignoring similar negative information from the same source regarding the
22 methodology that produces his highest cost of equity estimates, indicates that Dr. Morin's
23 testimony is result-oriented.

24
25 Q. PRIOR TO ADDRESSING THE INFIRMITIES OF EACH OF DR. MORIN'S
26 EQUITY COST METHODS, PLEASE EXPLAIN WHETHER THERE ARE
27 TECHNICAL ASPECTS OF HIS ANALYSES THAT CAUSE ALL THE METHODS
28 TO BE OVERSTATED.

29 A. Dr. Morin's equity cost estimate results for fully-integrated electric utilities and natural gas
30 distributors averages 11.1%. He recommends an 11.5% cost rate for HECO to account for
31 what he believes to be the Company's higher risk. There are technical flaws in each of his

1 equity cost analyses which cause the results to be overstated to varying degrees and which I
2 will discuss in detail below. However, there are two unnecessary adjustments applied to each
3 equity cost estimate which cause Dr. Morin's average ROE results to be overstated by
4 approximately 30 basis points (0.30%): the dividend yield adjustment and the flotation cost
5 adjustment.

6 Dr. Morin's Direct Testimony and Exhibits indicate that he has added flotation
7 costs to fourteen of the sixteen equity cost estimates he presents. His flotation cost
8 increases his recommended return on equity by 23 basis points. As I have explained in
9 Section II of my testimony, an explicit adjustment for flotation costs is unnecessary.
10 Removing that unnecessary 23 basis point adjustment from Dr. Morin's average equity cost
11 estimate for HECO indicates an average equity cost estimate of 10.87%, not 11.1%.

12
13 Q. YOU INDICATED THERE WERE TWO UNNECESSARY ADJUSTMENTS TO DR.
14 MORIN'S EQUITY COST ESTIMATES. WHAT IS THE OTHER ADJUSTMENT?

15 A. In all of his DCF analyses, as well as four of his Risk Premium analyses that depend in part
16 on the DCF, Dr. Morin overstates his cost of capital estimates by increasing the current
17 dividend by the full amount of one plus the DCF growth rate, of $(1+g)$. That adjustment
18 effectively assumes that the dividend of each of the companies he analyzed with a DCF
19 analysis increases immediately by $(1+g)$ and remains at that level for four quarters. That
20 circumstance is most unlikely to exist. The more standard assumption used in large sample
21 mechanistic analyses such as those presented in this testimony by Dr. Morin is to assume
22 that dividend increases occur throughout the year for the sample of companies and, on
23 average, the dividend should be increased by one half the DCF growth rate, not the full
24 growth rate. The Federal Energy Regulatory Commission in its generic equity cost
25 rulemaking proceedings in the 1980s and early 1990s determined that increasing the current
26 dividend by $(1+0.5g)$ was appropriate. Dr. Morin's use of $(1+g)$, therefore, overstates his
27 DCF result.

28 As shown on Dr. Morin's Exhibits HECO 2005 through HECO 2009, his dividend
29 growth adjustment $(1+g)$ increases the cost of equity capital by approximately 26 basis

1 points. This represents an overstatement of the cost of equity of 13 basis points because a
2 dividend adjustment of $(1+0.5g)$ is more appropriate for the type of DCF analysis
3 employed by Dr. Morin. Also because ten of the sixteen cost of equity analyses used by
4 Dr. Morin use the DCF, and because he ultimately relied on the truncated average of his
5 results, a 13 basis point overstatement of the DCF results indicates an overstatement of
6 approximately 8 basis points overall.

7 That 8 basis point overstatement caused by assuming that all dividends increase
8 immediately, combined with the inclusion of an unnecessary 26 basis flotation cost
9 adjustment causes Dr. Morin's equity cost estimates to be overstated by approximately 34
10 basis points. Therefore Dr. Morin's equity cost analyses actually indicate an average cost of
11 equity capital for HECO of 10.76%, not the 11.1% he reports in his Direct Testimony.

12 Finally, it is important to note that Dr. Morin's more recent electric utility cost of
13 equity testimony, filed in March 2005 in New Hampshire (op cit) indicates a current average
14 equity cost of 10.77%²⁹. $[(\text{mean}=10.7\% + \text{truncated mean}=10.7\% + \text{median}=10.9\%) / 3$
15 $= 10.77\%]$ In that more recent testimony Dr. Morin used two electric utility sample groups
16 (Moody's Electric Utilities and Investment Grade Vertically Integrated Electric Utilities)
17 and one gas distributor group, just as he does in this proceeding. Therefore, Dr. Morin's
18 more recent testimony indicates that the cost of common equity of electric utilities has
19 declined about 40 basis points since he filed his testimony in this proceeding.

20
21 Q. HOW IS YOUR DISCUSSION OF DR. MORIN'S INDIVIDUAL EQUITY COST
22 ESTIMATION METHODS ORGANIZED?

23 A. I will discuss Dr. Morin's equity cost analyses in the order they are presented in his
24 testimony: CAPM, ECAPM, Risk Premium and the DCF.

25

²⁹ Morin Direct Testimony, N.H.P.U.C. Docket No. DE 04-177, Public Service Company of New
Hampshire, March 25, 2005, p. 56, ll. 3 and 4)

A. CAPITAL ASSET PRICING MODEL

Q. WHAT ARE YOUR COMMENTS ON DR. MORIN'S CAPM ANALYSIS?

A. There are three factors in any CAPM cost of equity estimate: the risk-free rate, the market risk premium and the beta coefficient. Each of these elements in Dr. Morin's CAPM analysis serves to overstate the cost of equity capital.

With regard to the risk-free rate, Dr. Morin uses only long-term Treasury Bonds. In DOD 203 attached to this testimony, I explain why the selection of that long-term rate can cause an overstatement of the cost of equity and will not repeat that logic here. It is sufficient to note that long-term T-Bond yields are higher than short-term yields because the former contain additional maturity risk that the latter do not. That maturity risk, which is actually the risk of potential inflation over the long-term, is also a systematic risk that is accounted for, theoretically, by beta, and by using long-term T-Bonds in a CAPM analysis that risk is improperly double-counted.

In addition, at page 16 of his Direct Testimony Dr. Morin references the author of the "best selling corporate finance textbook," Professor Steward Meyers. When using the CAPM to estimate the cost of common equity, Professor Meyers recommends that short-term US Treasury securities be used to determine the risk-free rate. In the alternative, in order to estimate projected risk-free rates, Professor Meyers recommends the use of current long-term T-Bond yields less the long-term difference between T-Bond and T-Bill yields.³⁰ Dr. Morin did not make the risk-free rate adjustment recommended by Meyers.

Currently, long-term T-Bonds are yielding about 5.0% and, according to Ibbotson Associates 2004 Yearbook, the long-term difference between the yields of T-Bonds and T-Bills has been 2.0%. Therefore, according to a source he believes to be "a prominent finance scholar," Dr. Morin's risk-free rate for the CAPM should be no higher than 3% (5% current long-term T-Bond yield less the 2% average difference between long-term and short-term US Treasury bond yields). However, Dr. Morin's CAPM risk free rates in this

³⁰ Meyers, S., Brealey, R. Principles of Corporate Finance, 4th Ed., McGraw-Hill, New York, 1993, pp. 193-194)

1 proceeding, 5.5% and 6%, are 250 to 300 basis points higher than that called for by an
2 authoritative source he, himself, cites.

3 Finally, regarding the issue of the risk-free rate in the CAPM, Dr. Morin has also
4 provided estimates based on projected long-term bond yields in May 2005, based on an
5 interest rate forecast for 10-year US Treasury notes. That adds an unnecessary 60 basis
6 points to his already inflated CAPM estimates. The source on which Dr. Morin relied
7 predicted a 5.2% 10-year T-Bond yield in May 2005. It's now very close to May and the
8 current 10-year T-Bond yield, according to the Federal Reserve Statistical Release H.15 is
9 4.45%—fully 75 basis points below the projection on which Dr. Morin relied.

10 For more than a year some investor services have been forecasting that long-term
11 Treasury bond yields were going to rise due to the economic recovery and, as shown
12 previously in my testimony, long-term T-Bond rates have actually declined over the past six
13 months. The current bond yield is the most accurate measure of investors' return
14 expectations and should be the measure used in a CAPM cost of equity estimate, not what
15 the bond yield might or might not be sometime in the future.

16

17 Q. WHAT ARE YOUR COMMENTS REGARDING THE BETA COEFFICIENT IN DR.
18 MORIN'S STANDARD CAPM ANALYSIS?

19 A. My concern with Dr. Morin's beta is not related to the source of the beta or the manner in
20 which it is calculated (we both use betas published by Value Line). Rather it is related to Dr.
21 Morin's inter-jurisdictional inconsistency in the manner in which he elects to treat the data.
22 As I have noted previously, in a recent testimony on behalf of Atlanta Gas Light, Dr. Morin
23 used the average beta coefficient of integrated electric utilities (0.80) as a proxy for gas
24 distributors, which actually had a lower average beta (0.75). In that testimony, he argued that
25 gas distribution investment risk was similar to that of electrics, and produced a higher
26 CAPM equity cost because of that assumption.

27 In this case, Dr. Morin testifies at page 32 of his Direct that gas distributors have
28 lower risk than fully-integrated electrics and does not use the gas distributor beta to estimate
29 the CAPM beta coefficient. While I don't disagree with Dr. Morin's position regarding the

1 relative risk of electric and gas utilities in this proceeding. I do take issue with the
2 "flexibility" with which he elects to interpret the same data.

3
4 **Q. WHAT ARE YOUR COMMENTS REGARDING DR. MORIN'S CALCULATION OF**
5 **THE MARKET RISK PREMIUM IN HIS CAPM ANALYSIS?**

6 **A. Dr. Morin averages a long-term historical market premium provided by Ibbotson Associates**
7 **and a forward-looking market premium calculated by applying a DCF analysis to a group**
8 **of stocks followed by Value Line. With regard to Dr. Morin's market risk premium, there**
9 **are two points of issue.**

10 First, when using the historical Ibbotson data, Dr. Morin elects to rely only on the
11 difference between the earned return of stock and the yields of bonds. His rationale is that
12 there have been unanticipated gains with bond investments and the historical yields better
13 represents investor expectations. However, there is no analogue for stocks and the metric
14 used by Ibbotson Associates is the earned return on either the S&P 500 or the NYSE index.
15 The return series are better balanced and have more meaning for determining expectations if
16 earned returns are used for both series. As Dr. Morin notes at page 28 of his Direct, the
17 difference between the earned return series is 6.6% (i.e., the average historical return on
18 stocks has been 6.6% higher than the average historical return on bonds). Dr. Morin has
19 elected to use 7.2% based on bond yields, because, as he notes in his Direct Testimony at
20 page 24, "Ibboston Associates recommend" its use.

21 However, in a recent paper published by Ibbotson in the Financial Analysts' Journal
22 indicates that the maximum expected market risk premium (the return equity investors
23 expect over bond yields) is 6%, not the 7.2% used by Dr. Morin in his testimony.³¹ In that
24 recently published paper, Dr. Ibboston discusses the current theoretical debate over the
25 market risk premium. That debate centers on the fact that recent studies have shown that
26 long-term historical risk premiums overstate current investor expectations. As Ibbotson
27 notes the current research indicates that the market risk premium going forward ranges from

³¹ Ibbotson, R., Peng, C., "Long-Run Stock Returns: Participating in the Real Economy," *Financial Analysts' Journal*, Jan/Eary/February 2003, pp. 88-98.

1 0% to a maximum of about 5% (op cit., pp. 88, 89). Ibbotson disagrees with that current
2 research and provides his analysis of the issue, which shows a prospective market risk
3 premium to range from 4% (based on a geometric average) to 6% (based on an arithmetic
4 average).

5 The point here is simple. Dr. Morin has selected a particular historical market risk
6 premium for his CAPM because Ibbotson recommended it, but in a more current
7 publication, Dr. Ibbotson indicates the prospective market risk premium is 6% (at the upper
8 end), not the 7.2% Dr. Morin elected to use.

9 Second, Dr. Morin also constructed a forward-based market risk premium based on
10 a DCF analysis of the universe of stocks followed by Value Line. Dr. Morin advises the
11 Commission to be cautious about relying on DCF estimates, yet, he bases his preferred risk
12 premium methodology, in part, on a DCF analysis. If the DCF provides a reasonable
13 estimate of the expected return for the entire Value Line universe of stocks it is reasonable
14 to believe it would provide an accurate estimate of the cost of equity for utilities. This
15 presents a conflict of logic in Dr. Morin's testimony.

16
17 Q. GIVEN THE INFIRMATIES CITED ABOVE, WHAT DO YOU BELIEVE WOULD
18 PROVIDE A MORE ACCURATE ESTIMATE OF THE CAPM COST OF EQUITY
19 FOR HECO?

20 A. The current long-term T-bond rate is 4.76% (see DOD 211). Dr. Morin's 0.78 average beta
21 for his broad electric sample group is equal to the 0.78 for my sample group which was
22 screened to be similar in risk to HECO. Ibbotson's current projection regarding the market
23 risk premium of 6% based on T-bonds as a risk-free rate is also reasonable. Although it
24 must be remembered that Ibbotson's 6% risk premium represents the upper end of current
25 market risk premium projections. Putting these factors together provides a CAPM equity
26 capital cost estimate for HECO of 9.4% [$k = 4.76\% + 0.78(6\%) = 9.4\%$]. That equity cost
27 estimate also gives no consideration to geometric average market risk premiums and, as
28 such, even though that result is far below the CAPM results reported by Dr. Morin, it
29 probably overstates the current cost of equity capital for electric utilities.

1 Q. WHAT ARE YOUR COMMENTS ON DR. MORIN'S USE OF THE EMPIRICAL
2 CAPM—THE ECAPM?

3 A. As Dr. Morin notes at page 28 of his Direct, the "empirical" CAPM (ECAPM) is designed
4 to account for the fact that the security market line is believed to have a lower slope than
5 postulated theoretically. A lower slope for the capital market line implies that the CAPM
6 understates equity costs for low beta stocks like utilities and over-estimates the equity cost
7 rate for high beta stocks like "dot-com" companies. The flaw in Dr. Morin's "empirical"
8 CAPM analysis and the reason (in addition to the other reasons outlined above for the
9 standard CAPM) that his ECAPM equity cost estimate overstates the actual cost of capital is
10 that he uses "adjusted" betas in his ECAPM analysis.

11 Beta estimates published by Value Line are adjusted for the theoretical tendency for
12 beta coefficient to migrate toward the market average of 1.0. "Adjusted" betas are higher
13 for low-beta stocks like utilities and lower for high-beta stocks like "dot-com" companies.
14 In other words, when low betas are adjusted upward and high betas are adjusted downward,
15 that has the same effect as lowering the slope of the capital market line. Using "adjusted"
16 betas along with an ECAPM analysis double-counts the effect of changing the slope of the
17 capital market line. Moreover, all of the theoretical research Dr. Morin cites regarding the
18 support for the ECAPM (except his own) is based on studies using "raw" or
19 "unadjusted" betas.

20 Except for the anomalies cited in the discussion above regarding risk-free rate, beta
21 and the market risk premium, Dr. Morin's ECAPM analysis would not be problematic on
22 theoretical grounds if he used "raw" betas rather than "adjusted" betas. Value Line has a
23 standard formula for adjusting "raw" betas to the adjusted betas that are published by that
24 investor service, and Dr. Morin has published that formula in his book, Regulatory Finance.
25 It is possible, therefore, to calculate what "raw" beta supports the reported value line beta.

26 For a reported Value Line beta coefficient of 0.78 for the electric utility group
27 studied by Dr. Morin, the average "raw" beta would have been 0.67. Using that "raw"
28 beta in Dr. Morin's ECAPM formula shown on page 28 of his Direct Testimony (changing
29 nothing else) produces an equity cost indication of 11.14%. That result is about 60 basis

1 points lower than the 11.8% reported by Dr. Morin, which is based on the use of
2 "adjusted" betas and which effectively double-counts the effect of lowering the slope of the
3 capital market line and raising the cost of equity estimate for low beta stocks.

4 Finally, using Dr. Morin's ECAPM equation, "raw" average beta for electric
5 companies (0.67), a current long-term T-bond risk-free rate (4.76%) and Ibbotson's
6 projected market risk premium (6%), the equity cost estimate would be 9.275% [$k = 4.76\%$
7 $+ 0.25(6\%) + 0.75(0.67)(6\%) = 9.275\%$].
8

9 **B. RISK PREMIUM**
10

11 **Q. PLEASE DESCRIBE THE RISK PREMIUM ANALYSES UNDERTAKEN BY DR.**
12 **MORIN IN HIS DIRECT TESTIMONY IN THIS PROCEEDING.**

13 **A. Dr. Morin has performed six separate risk premium analyses based on historical data. The**
14 **risk premium analyses Dr. Morin utilizes include an examination of the historical return**
15 **difference between earned returns of electric and gas companies and the yield on long-term**
16 **treasury bonds. Company witness Morin performs this analysis over a period beginning in**
17 **1931 for electric utilities and 1954 for gas utilities. The time period difference, he notes, is**
18 **due to the availability of data. In the final risk premium analysis, Dr. Morin compares the**
19 **allowed returns for electric and gas utilities with then-current T-Bond yields from 1990**
20 **through 2001. Each of those risk premium analyses is calculated using current and**
21 **projected bond yields.**
22

23 **Q. PRIOR TO DISCUSSIN THE DETAILS OF EACH OF THOSE RISK PREMIUM**
24 **ANALYSES, DO YOU HAVE ANY COMMENTS OF A GENERAL NATURE**
25 **REGARDING RISK PREMIUM-TYPE ANALYSES?**

26 **A. Yes. A fundamental precept on which the risk premium methodology is based holds that the**
27 **higher risk of stocks over bonds requires an incrementally higher return for those stocks in**
28 **order for investors to be compensated for assuming the higher risk. Although that is**
29 **generally true, it is most important to realize that, given a current bond yield of about 5.5%**

1 for A-rated utilities, an equity return of 8%, 10%, 13% or even 50% would fulfill the
2 requirement of providing a "premium" over debt costs. The real issue with a risk premium
3 analysis is determining that premium with any precision. It is not a directly observable
4 phenomenon.

5 There are two other fundamental tenets upon which risk premium-type analyses are
6 grounded which, when examined, indicate that this equity cost estimation methodology
7 should not be given primary consideration in setting allowed rates of return. First, since risk
8 premium analyses look backward in time, they assume "past is prologue." In other words,
9 the investors' expectations for the future are assumed to mirror the average results they have
10 experienced in the past. Second, implicit in the use of an average historical return premium
11 of equities over debt is the assumption that the risk premium is constant over time. Neither
12 of these assumptions upon which the risk premium analysis rests is true.

13 That the risk premium varies significantly from period to period is shown most
14 clearly in Dr. Morin's Exhibit HECO-2002, which shows the data on which his risk
15 premium results are based. The common stock annual returns on which Company witness
16 Morin relied have ranged from +77% to -37%, while bond annual returns have ranged from
17 +33% to -10%. Therefore, the assumption in the Risk Premium analysis that historical
18 average results are constant does not provide a sound basis on which to estimate current
19 equity capital cost rates.

20 The practical impact of the volatility of historical risk premium data is that, with the
21 selection of any particular period over which to average the historical data, virtually any risk
22 premium result can be produced. In addition, the use of historical earned return data to
23 estimate current equity capital costs has been questioned in the financial literature, by an
24 authority on which Dr. Morin has elected to rely:

25
26 There are both conceptual and measurement problems with
27 using I&S [Ibbotson and Sinquefeld] data for purposes of
28 estimating the cost of capital. Conceptually, there is no
29 compelling reason to think that investors expect the same
30 relative returns that were earned in the past. Indeed, evidence
31 presented in the following sections indicates that relative
32 expected returns should, and do, vary significantly over time.
33 Empirically, the measured historic premium is sensitive both
34 to the choice of estimation horizon and to the end points.

1 These choices are essentially arbitrary, yet they can result in
2 significant differences in the final outcome. ("The Risk
3 Premium Approach to Measuring a Utility's Cost of
4 Equity," Brigham, Shome and Vinson, Financial
5 Management, Spring 1985, p. 34)
6

7 The type of data described in the quote above as both conceptually and empirically
8 problematic forms the basis of Dr. Morin's Risk Premium methodology.
9

10 **Q. WHAT ARE YOUR COMMENTS REGARDING DR. MORIN'S HISTORICAL RISK**
11 **PREMIUM ANALYSIS?**

12 **A. This form of the risk premium analysis measures the earned return on common stocks and**
13 **subtracts from that the yield on long-term Treasury bonds to produce a risk premium.**
14 There have been fundamental changes in the nature of the relationship between stock returns
15 and bond returns over the past sixty or seventy years. The data in Dr. Morin's Exhibit
16 HECO-2002, indicate that from about 1930 through 1960 stock returns were quite volatile
17 showing very wide swings while bond returns were less volatile. However, in more recent
18 years (since 1960), stocks have actually become less volatile while bonds have become more
19 volatile, showing much wider swings in returns. Those data indicate that the current
20 relationship between the returns of bonds and stock is different than it has been over the
21 longer time frame. The table below, also taken from Dr. Morin's Exhibit HECO-2002 data,
22 confirms that the return difference between bonds and stocks has declined from the levels
23 reported by Dr. Morin.
24

<u>Years</u>	<u>Bond Return</u>	<u>Stock Return</u>	<u>Risk Premium</u>
31-01	5.39%	10.94%	5.55%
61-01	7.11%	11.24%	4.13%
71-01	8.90%	12.91%	4.01%
81-01	11.79%	16.40%	4.62%

25
26 These data indicate that over the most recent 40 years, risk premiums between electric utility
27 stock returns and Treasury bonds have averaged about 4.25% rather than the 5.6% Dr.
28 Morin reports in his testimony. If current T-bond yields are 4.76%, these more recent data

1 indicate that an appropriate return on common equity for electric utilities would be 9.01%
2 (4.76% + 4.25% = 9.01%), rather than the 11.1% result produced in the Company's
3 analysis of the same data.

4 Also, Dr. Morin provides other evidence in his testimony that underscores the
5 shrinking nature of risk premiums. His HECO-2003 contains his analysis of the return
6 difference between Moody's gas utility index and Treasury bonds. That analysis begins in
7 1954 due to a more limited data set. If we look at the total time period as well as the twenty,
8 thirty and forty-year time periods cited above, the results confirm that more current risk
9 premium are smaller. The table below shows the values for gas utility returns and bond
10 returns extracted from Dr. Morin's HECO-2003.

11

<u>Years</u>	<u>Bond Return</u>	<u>Stock Return</u>	<u>Risk Premium</u>
54-01	6.50%	12.16%	5.66%
61-01	7.11%	11.43%	4.32%
71-01	8.90%	13.04%	4.14%
81-01	11.79%	14.02%	2.24%

12
13 **Q. WHERE ARE YOUR COMMENTS REGARDING DR. MORIN'S OTHER RISK**
14 **PREMIUM ANALYSIS—THE "ALLOWED RETURN" RISK PREMIUM?**

15 **A.** Dr. Morin's other risk premium analysis is one that compares historical allowed equity
16 returns to annual average bond yields. That study indicates that the average risk premium
17 between allowed returns for electric utilities and bond yields over the past 10 years is 5.4%.
18 However, Dr. Morin concludes that a negative correlation exists between current bond
19 yields and risk premiums and, due to that relationship, imputes a larger risk premium to
20 reach an equity cost estimate of 11.2%.

21 It is important to understand at the outset that the annual cost rate differences
22 between the allowed returns and utility bond yields are not necessarily reliable indicators of
23 investor-required risk premiums. First, the allowed returns are simply averaged over all the
24 available rate case decisions during a calendar year. That means that the capital market data
25 that the regulatory body considered was drawn from a time prior to the decision rendered
26 and the allowed return might not correlate with decision-time-specific macro-economic

1 events. In some cases, that period of time between the hearing and the decision can be
2 substantial.

3 Second, the relative risk of the utility for which the equity return was determined is
4 not a factor in Dr. Morin's analysis. For example, the allowed return on equity for a
5 "BB"-rated firm would simply be averaged in with the other returns allowed during a
6 calendar year. Third, while the inclusion of an outlier may not be problematic in years in
7 which there are many rate case decisions, that would not be the case in years in which the
8 number of decisions is small. Moreover, regulatory rate case decision data with which I am
9 familiar shows that the number of regulatory decisions has decreased in recent years (e.g., 7
10 decisions in 2004).³² The source of Dr. Morin's data notes that "[a]s the number of equity
11 return determinations has declined, the average authorized return now has less of a
12 relationship to the return than the typical electric, gas, or telecommunications company has
13 an opportunity to earn."

14
15 Q. YOU NOTED THAT DR. MORIN PLACES EMPHASIS ON A NEGATIVE
16 CORRELATION BETWEEN INTEREST RATES AND RISK PREMIUMS IN
17 REACHING HIS EQUITY COST ESTIMATE. PLEASE COMMENT ON THAT
18 ISSUE.

19 A. Dr. Morin subtracts average bond yields for utilities from the equity returns allowed utility
20 companies over the past 10 years. Then, through a regression analysis, the Company
21 witness describes a relationship between bond yields and risk premiums and uses that
22 relationship, with the current cost of debt to estimate the Company's cost of equity. Aside
23 from the problems that exist generally with the data used in the analysis, noted above, there
24 are additional problems with this particular approach. Further, those problems illustrate that
25 Dr. Morin's adjustments to historically-derived risk premiums are not reliable for equity
26 cost estimation purposes.

27 Although Dr. Morin's regression analysis shows a relatively strong correlation
28 between risk premium and bond yields ($r^2 = 0.83$), that is not surprising because the

³² Regulatory Research Associates, "Major Rate Case Decisions, Regulatory Focus".

1 resultant risk premium is a direct arithmetic function of the prevailing bond yield. A high
2 correlation coefficient is not meaningful if the dependent and independent variables are said
3 to be "auto-correlated."

4 If regression variables are auto-correlated, the differences between the actual values
5 and the regression equation (the residuals) have a lagged correlation with their own past
6 values (i.e., they are not independent of each other). Therefore, the regression equation will
7 not necessarily serve as an accurate predictor of the relationship between the variables
8 because the residual error will continue to increase over time. This can be especially
9 problematic in time-series studies of the type included in Dr. Morin's risk premium
10 analysis.

11 Dr. Morin does not offer the Commission any information regarding whether his
12 data are auto-correlated. However, in the absence of any showing otherwise, it is reasonable
13 to conclude that those data series are auto-correlated based on the inclusion of the risk
14 premium as a variable. The risk premium is an arithmetic function of the bond yield, which
15 is the other parameter in the regression.³³ Therefore, results of Dr. Morin's risk premium
16 regression analysis may not be a reliable indicator of the cost of equity capital and should
17 be given little weight by this Commission.

18
19 **Q. ARE THERE OTHER STUDIES THAT EXAMINE THE RELATIONSHIP BETWEEN**
20 **RISK PREMIUMS AND INTEREST RATE LEVELS?**

21 **A. Yes. Members of the Virginia Corporation Commission Staff published a study of that**
22 **relationship in 1995.³⁴ That paper is interesting in that it shows that within certain shorter-**
23 **term sub-periods an inverse relationship appears to exist, but over the entire 1980 through**
24 **1993 study period—as interest rates declined from the very high levels of the early**
25 **1980s—absolute risk premium levels fell. Moreover, this study was based on electric utility**

³³ One study of the correlation between risk premiums and bond yields recognizes that there is "severe positive autocorrelation" in the historical risk premium/bond yield data. (Harris, R., Marston, F., "The Market Risk Premium: Expectational Estimates Using Analyst's Forecasts," *Journal of Applied Finance*, 2001, pp. 6-16, footnote 7)

³⁴ Maddox, F., Pippert, D., and Sullivan, R., "An Empirical Study of Ex Ante Risk Premiums for the Electric Utility Industry," *Financial Management*, Vol. 24, No. 3, Autumn 1995, pp. 89-95.

1 market return data and estimated rather than allowed equity cost rates.

2 The average risk premium between electric utility cost of equity and long-term
3 Treasury bond yields averaged 3.21% over the 1980-1993 study period and the average T-
4 bond yield was 9.77%. Given that the most recent six-week average T-Bond yield is 4.76%,
5 the difference between the current T-Bond yield and that which existed, on average, during
6 the study period (9.77%), is 5.01%. Multiplying that yield difference by the relationship
7 found in the Virginia Commission Staff study produces a current risk premium of 5.06%
8 ($5.01\% \times 0.37 = 1.85\% + 3.21\% = 5.06\%$). That "adjusted" risk premium, added to the
9 current T-Bond rate (4.76%) produces a cost of capital indication of 9.82% ($4.76\% +$
10 5.06%).

11 Therefore, if one elects to believe such data are reliable (which I do not), there are
12 studies of the relationship between interest rates and risk premiums in the literature which 1)
13 show a declining trend in risk premiums over the 1980s and early 1990s, 2) are based on
14 the cost of equity of electric utilities, not unregulated firms and 3) produce equity cost
15 estimates which are substantially below those presented by Dr. Morin and tend to
16 corroborate the equity cost estimates I provide in this testimony.

17
18 C. DISCOUNTED CASH FLOW
19

20 Q. HAVE YOU REVIEWED THE DETAILS OF DR. MORIN'S DCF ANALYSES?

21 A. Yes, I have.
22

23 Q. WHAT ARE YOUR COMMENTS REGARDING DR. MORIN'S DCF ANALYSIS?

24 A. Dr. Morin's standard DCF analysis relies on dividend yields published in Value Line. I
25 have no concerns with the use of that parameter. As I have noted previously, Dr. Morin
26 increases the current dividend by one plus the DCF growth rate, which tends to overstate the
27 dividend yield if applied to all companies in the sample group.

28 The growth rate portion of Dr. Morin's DCF analysis is more problematic. First,
29 Dr. Morin's growth rate analysis is mechanistic in that it simply plugs selected projected

1 data into a formula to produce a growth rate with no underlying analysis of either the
2 historical or projected growth rate fundamentals. Dr. Morin, in his own published work,
3 warns against this type of analysis.³⁵

4 Second, Dr. Morin's growth rate analysis relies exclusively on earnings growth rate
5 projections. As I discussed in detail in DOD 201 attached to this testimony, heavy reliance
6 on earnings growth, absent any examination of the underlying fundamentals of long-run
7 growth, can lead to inaccurate equity cost estimates. For example, reliance on projected
8 earnings growth in a situation in which projected earnings were expected to recover from
9 reduced levels would include in any DCF result the assumption that equity returns will
10 increase at the same rate every five years into the indefinite future. That, of course, would
11 not be a reasonable expectation, and any DCF analysis based on a mechanistic analysis that
12 automatically includes such data would not produce a reasonable result. Therefore, while I
13 have no problem with the consideration of earnings growth rate projections in determining
14 DCF growth, they should not be afforded the heavy weighting allowed by Dr. Morin,
15 especially absent consideration of the underlying factors.

16 Third, as I noted above, Dr. Morin uses both Zack's and Value Line earnings
17 projections in determining his standard DCF growth rate. Earnings growth projections are
18 the only growth rate that Zack's publishes, so the use of that parameter is reasonable.
19 However, in addition to and right along side of its earnings projections, Value Line also
20 publishes 3- to 5-year dividend and book value growth rate projections for each company it
21 follows. Investors have equal access to all three growth rates and, it would be reasonable to
22 assume, utilize all three when making a determination of long-term sustainable growth.
23 Moreover, in theory, the DCF assumes that earnings, dividends and book value all grow at
24 the same rate. Therefore, the use of the average of those three projected growth rate
25 parameters published in Value Line would provide a more balanced growth rate analysis in
26 Dr. Morin's mechanistic standard DCF model.

³⁵ Morin, R., Regulatory Finance, Utilities' Cost of Capital, Public Utilities Reports, Arlington, VA, 1994, p. 244.

For example, Dr. Morin's Exhibit HECO-2010 contains his DCF analysis of his gas distribution sample group, based only on Value Line's earnings projections. The table below replicates Dr. Morin's analysis using the projected earnings, dividends and book value as well as the dividend yield published in the March 18, 2005 edition of Value Line.

Company	Value Line Projected Growth			Dividend Yield
	Earnings	Dividends	Book Value	
AGL Resources	5.00%	2.50%	8.00%	3.60%
Atmos Energy	6.25%	2.00%	8.50%	4.50%
Energizer	NMF	NMF	NMF	1.20%
KeySpan	4.50%	2.00%	5.00%	4.60%
Laclede Group	6.00%	1.00%	11.00%	4.50%
New Jersey Res.	8.00%	3.00%	11.00%	3.10%
NICOR	1.50%	2.00%	2.00%	5.00%
Northwest NG	5.00%	2.50%	4.00%	3.60%
Peoples Energy	1.00%	1.50%	4.50%	5.00%
Piedmont NG	7.50%	4.00%	7.50%	3.90%
Southwest Gas	10.50%	1.50%	4.00%	3.30%
UGI Corp.	7.50%	7.00%	12.00%	2.90%
WGL Holdings	6.50%	1.50%	4.50%	4.30%
Average	5.77%	2.54%	6.83%	
Overall Average		5.05%		4.02%
DCF Cost of Equity			9.17%	

These data show that the average of Value Line's projected earnings, dividends and book value (all of which are available to investors) is 5.05%, roughly 85 basis points below the 5.9% earnings-only Value Line growth rate selected by Dr. Morin. The above table also shows Value Line's recently published dividend yield for Dr. Morin's companies (4.02%). Using Dr. Morin's methodology of multiplying that dividend by (1+g) to determine the "expected dividend yield" and adding that to the average growth rate produces a DCF cost of equity estimate based on all the current, available Value Line projected data, of 9.17%.

That equity cost estimate based on all the Value Line data is virtually identical to the mid-point of the equity return I recommend in this proceeding for fully-integrated electrics—9.125%. Moreover, simply by using all the projected data available to Value Line subscribers, that 9.17% equity cost estimate, based on Dr. Morin's own methodology is

1 more than 100 basis points below the 10.5% DCF result he provides in his Exhibit HECO-
2 2010.

3
4 Q. DO YOU HAVE ANY OTHER COMMENTS REGARDING DR. MORIN'S DCF
5 ANALYSES, MR. HILL?

6 A. Yes. In determining his DCF cost of equity estimates, Dr. Morin tends to exclude low
7 results and retain high results to produce his averages. That leads to overstates equity cost
8 estimates.

9 For example, in his DCF analysis of vertically-integrated electric utilities, Dr. Morin
10 first excludes from consideration all companies that have negative projected earnings growth
11 rates. While, on its face, this seems reasonable it is more a result of the problems attendant
12 to a myopic focus on one growth rate parameter rather than the inability to forecast long-
13 term growth. Also, while some companies would expect negative growth in the future others
14 would expect extraordinary growth that could not be sustainable. That higher growth would
15 also not be representative of long-term investor expectations. Yet, Dr. Morin elects to leave
16 the high (9.5%, 16%) growth rates in the analysis. In balance, with all growth rates
17 considered for all 20 electrics, the average growth rate is 4.4% (see HECO-2008, p. 1).

18 It seems logical, if one is to exclude growth rates, to do it in a statistically balanced
19 fashion. In the case of Dr. Morin's Moody's electric sample, the average growth rate is
20 about 4.4% and the standard deviation is also about 4%. If we exclude growth rates in a
21 balanced fashion, i.e., those above and below one standard deviation about the mean, that
22 would rid the sample of negative growth rates as well as unusually high growth rates.
23 Employing that more balanced analysis produces an average growth rate of
24 4.0%—somewhat below the average growth obtained from the entire sample. However,
25 excluding only the negative growth rates and retaining all the high growth rate companies,
26 Dr. Morin is able to produce a DCF growth rate of 5.5% (see HECO-2008, p. 2).

27 However, Dr. Morin's de-selection process is not over. After removing the
28 companies with negative growth rates, he removes companies for which his DCF analysis
29 produces a result below 7%. Again, this process is undertaken without consideration for

1 DCF results that might be too high. Only the "low" results are removed. Left in the final
2 DCF average are companies with DCF results of 19.9% and 13.4% (see HECO-2008, p.
3 2).

4 Again, if one took a balanced approach to eliminating high and low estimates by
5 excluding those estimates outside 1 standard deviation about the mean, the same low results
6 would be excluded but the three highest results would also be excluded. The average DCF
7 in that case would be about 8%, well below the 9.1% reported by Dr. Morin.

8 In summary, Dr. Morin's DCF analyses are not statistically balanced and tend to
9 emphasize high DCF growth rates while suppressing low growth. As a consequence his
10 DCF results overstate the actual equity capital cost of fully-integrated electric companies
11 like HECO.

12

13 Q. DOES THIS CONCLUDE YOUR DIRECT TESTIMONY, MR. HILL?

14 A. Yes, it does.

**EDUCATION AND EMPLOYMENT HISTORY
OF
STEPHEN G. HILL**

EDUCATION

Auburn University - Auburn, Alabama - Bachelor of Science in Chemical Engineering (1971); Honors - member Tau Beta Pi national engineering honorary society, Dean's list, candidate for outstanding engineering graduate; Organizations - Engineering Council, American Institute of Chemical Engineers

Tulane University - New Orleans, Louisiana - Masters in Business Administration (1973); concentration: Finance; awarded scholarship; Organizations - member MBA curriculum committee, Vice-President of student body, academic affairs

Continuing Education - NARUC Regulatory Studies Program at Michigan State University

EMPLOYMENT

West Virginia Air Pollution Control Commission (1975)

Position: Engineer ; **Responsibility:** Overseeing the compliance of all chemical companies in the State with the pollution guidelines set forth in the Clean Air Act.

West Virginia Public Service Commission-Consumer Advocate (1982)

Position: Rate of Return Analyst ; **Responsibility:** All rate of return research and testimony promulgated by the Consumer Advocate; also, testimony on engineering issues, when necessary.

Hill Associates (1989)

Position: Principal; **Responsibility:** Expert testimony regarding financial and economic issue in regulated industries.

PUBLICATIONS

"The Market Risk Premium and the Proper Interpretation of Historical Data,"
Proceedings of the Fourth NARUC Biennial Regulatory Information Conference,
Volume I, pp. 245-255.

"Use of the Discounted Cash Flow Has Not Been Invalidated," Public Utilities
Fortnightly, March 31, 1988, pp. 35-38.

MEMBERSHIPS

American Institute of Chemical Engineers; Society of Utility and Regulatory Financial Analysts (Certified Rate of Return Analyst, Member of the Board of Directors)

PRIOR EXPERIENCE

Mr. Hill has testified on cost of capital, corporate finance and capital market issues in more than 220 regulatory proceedings before the following regulatory bodies: the West Virginia Public Service Commission, the Arizona Corporation Commission, the Texas Public Utilities Commission, the Public Utilities Commission of the State of California, the Public Service Commission of the State of Maine, the Maryland Public Service Commission, the Public Utilities Commission of the State of Minnesota, the Ohio Public Utilities Commission, the Insurance Commissioner of the State of Texas, the North Carolina Insurance Commissioner, the Rhode Island Public Utilities Commission, the City Council of Austin, Texas, the Hawaii Public Utilities Commission, the Missouri Public Service Commission, the South Carolina Public Service Commission, the Public Utilities Commission of the State of New Hampshire, the New Mexico Corporation Commission, the State of Washington Utilities and Transportation Commission, the Oklahoma Public Service Commission, the Public Service Commission of Utah, the Illinois Commerce Commission, the Kansas Corporation Commission, the Indiana Utility Regulatory Commission, the Virginia Corporation Commission, the Montana Public Service Commission, the Pennsylvania Public Utilities Commission, the Public Service Commission of Wisconsin, the Vermont Public Service Board, the Georgia Public Service Commission, the Federal Communications Commission and the Federal Energy Regulatory Commission. Mr. Hill has also testified before the West Virginia Air Pollution Control Commission regarding appropriate pollution control technology and its financial impact on the company under review and have been an advisor to the Arizona Corporation Commission on matters of utility finance in bankruptcy proceedings.

LONG-TERM GROWTH

Q. PLEASE PROVIDE AN EXAMPLE THAT DESCRIBES THE DETERMINANTS OF LONG-TERM SUSTAINABLE GROWTH.

A. Assume that a hypothetical regulated firm had a first period common equity or book value per share of \$10, the investor-expected return on that equity was 10% and the stated company policy was to pay out 60% of earnings in dividends. The first period earnings per share are expected to be \$1.00 (\$10/share book equity x 10% equity return) and the expected dividend is \$0.60. The amount of earnings not paid out to shareholders (\$0.40), the retained earnings, raises the book value of the equity to \$10.40 in the second period. The table below continues the hypothetical for a five-year period and illustrates the underlying determinants of growth.

TABLE A.

	<u>YEAR 1</u>	<u>YEAR 2</u>	<u>YEAR 3</u>	<u>YEAR 4</u>	<u>YEAR 5</u>	<u>GROWTH</u>
BOOK VALUE	\$10.00	\$10.40	\$10.82	\$11.25	\$11.70	4.00%
EQUITY RETURN	10%	10%	10%	10%	10%	-
EARNINGS/SH.	\$1.00	\$1.040	\$1.082	\$1.125	\$1.170	4.00%
PAYOUT RATIO	0.60	0.60	0.60	0.60	0.60	-
DIVIDENDS/SH.	\$0.60	\$0.624	\$0.649	\$0.675	\$0.702	4.00%

We see that under steady-state conditions, the earnings, dividends and book value all grow at the same rate. Moreover, the key to this growth is the amount of earnings retained or reinvested in the firm and the return on that new portion of equity. If we let "b" equal the retention ratio of the firm (1 – the payout ratio) and let "r" equal the firm's expected return on equity, the DCF growth rate "g" (also referred to as the internal or sustainable growth rate) is equal to their product, or

$$g = br. \qquad (i)$$

Professor Myron Gordon, who developed the Discounted Cash Flow technique and first

introduced it into the regulatory arena, has determined that Equation (i) embodies the underlying fundamentals of growth and, therefore, is a primary measure of growth to be used in the DCF model. Professor Gordon's research also indicates that analysts' growth rate projections are useful in estimating investors' expected sustainable growth.

I should note here that the above hypothetical does not allow for the existence of external sources of equity financing, i.e., sales of common stock. Stock financing will cause investors to expect additional growth if the company is expected to issue new shares at a market price that exceeds book value. The excess of market over book would inure to current shareholders, increasing their per share equity value. Therefore, if the company is expected to continue to issue stock at a price that exceeds book value, the shareholders would continue to expect their book value to increase and would add that growth expectation to that stemming from earnings retention or internal growth. Conversely, if a company were expected to issue new equity at a price below book value, that would have a negative effect on shareholder's current growth rate expectations. In such a situation, shareholders would perceive an overall growth rate less than that produced by internal sources (retained earnings). Finally, with little or no expected equity financing or a market-to-book ratio near unity, investors would expect the sustainable growth rate for the company to equal that derived from Equation (i), " $g = br$." Dr. Gordon¹ identifies the growth rate which includes both expected internal and external financing as:

$$g = br + vs, \quad (ii)$$

where,

g = DCF expected growth rate,
 r = return on equity,
 b = retention ratio,
 v = fraction of new common stock
sold that accrues to the current
shareholder,

¹Gordon, M.J., The Cost of Capital to a Public Utility, MSU Public Utilities Studies, East Lansing, Michigan, 1974, pp., 30-33.

**s = funds raised from the sale of stock
as a fraction of existing equity.**

Additionally,

$$v = 1 - BV/MP, \quad (iii)$$

where,

**MP = market price,
BV = book value.**

I have used Equation (iii) as the basis for my examination of the investor expected long-term growth rate (g) in this proceeding.

Q. IN YOUR PREVIOUS EXAMPLE, EARNINGS AND DIVIDENDS GREW AT THE SAME RATE (br) AS DID BOOK VALUE. WOULD THE GROWTH RATE IN EARNINGS OR DIVIDENDS, THEREFORE, BE SUITABLE FOR DETERMINING THE DCF GROWTH RATE ?

A. No, not necessarily. Rates of growth derived from earnings or dividends alone can be unreliable due to extraneous influences on those parameters such as changes in the expected rate of return on common equity or changes in the payout ratio. That is why it is necessary to examine the underlying determinants of growth through the use of a sustainable growth rate analysis.

If we take the hypothetical example previously stated and assume that, in year three, the expected return on equity rises to 15%, the resultant growth rate for earnings and dividends far exceeds that which the company could sustain indefinitely. The potential error in using those growth rates to estimate "g" is illustrated in the following table.

TABLE B.

	<u>YEAR 1</u>	<u>YEAR 2</u>	<u>YEAR 3</u>	<u>YEAR 4</u>	<u>YEAR 5</u>	<u>GROWTH</u>
BOOK VALUE	\$10.00	\$10.40	\$10.82	\$11.47	\$12.157	5.00%
EQUITY RETURN	10%	10%	15%	15%	15%	10.67%
EARNINGS/SH	\$1.00	\$1.040	\$1.623	\$1.720	\$1.824	16.20%
PAYOUT RATIO	0.60	0.60	0.60	0.60	0.60	-
DIVIDENDS/SH	\$0.60	\$0.624	\$0.974	\$1.032	\$1.094	16.20%

What has happened is a shift in steady-state growth paths. For years one and two, the sustainable rate of growth ($g=br$) is 4.00%, just as in the previous hypothetical. Then, in the last three years, the sustainable growth rate increases to 6.00% ($g=br = 0.4 \times 15\%$). If the regulated firm were expected to continue to earn a 15% return on equity and retain 40% of its earnings, then a growth rate of 6.0% would be a reasonable estimate of the long-term sustainable growth rate. However, the compound annual growth rate for dividends and earnings exceeds 16% which is the result only of an increased equity return rather than the intrinsic ability of the firm to grow continuously at a 16% annual rate. Clearly, this type of estimate of future growth cannot be used with any reliability at all. In the case of the hypothetical, to utilize a 16% growth rate in a DCF model would be to expect the company's return on common equity to increase by 50% every five years into the indefinite future. This would be a ridiculous forecast for any regulated firm and underscores the importance of utilizing the underlying fundamentals of growth in the DCF model.

It can also be demonstrated that a change in our hypothetical regulated firm's payout ratio makes the past rate of growth in dividends an unreliable basis for predicting "g". If we assume our regulated firm consistently earns its expected equity return (10%) but in the third year, changes its payout ratio from 60% to 80% of earnings, the results are shown in the table below.

TABLE C.

	<u>YEAR 1</u>	<u>YEAR 2</u>	<u>YEAR 3</u>	<u>YEAR 4</u>	<u>YEAR 5</u>	<u>GROWTH</u>
BOOK VALUE	\$10.00	\$10.40	\$10.82	\$11.036	\$11.26	3.01%
EQUITY RETURN	10%	10%	10%	10%	10%	-
EARNINGS/SH.	\$1.00	\$1.040	\$1.082	\$1.104	\$1.126	3.01%
PAYOUT RATIO	0.60	0.60	0.80	0.80	0.80	7.46%
DIVIDENDS/SH.	\$0.60	\$0.624	\$0.866	\$0.833	\$0.900	10.67%

What we see here is that, although the company has registered a high dividend growth rate (10.67%), it is, again, not at all representative of the growth that could be sustained indefinitely, as called for in the DCF model. In actuality, the sustainable growth rate has declined from 4.0% the first two years to only 2.0% ($g=br = 0.2 \times 10\%$) during the last three years due to the increased payout ratio. To utilize a 10% growth rate in a DCF analysis of this hypothetical regulated firm would 1) assume the payout ratio of the firm would continue to increase 33% every five years into the indefinite future, 2) lead to the highly implausible result that the firm intends to consistently pay out more in dividends than it earns and 3) grossly overstate the cost of equity capital.

SAMPLE COMPANY GROWTH RATE ANALYSES

ELECTRIC UTILITIES

CV – Central Vermont Public Service – CV's sustainable growth rate has averaged 2.37% over the most recent five year period (2000-2004), including a setback with low growth in 2001. Also, the company's sustainable growth in the most recent year, about 3%, indicates an increasing growth trend. VL expects CV's sustainable growth to rise above that historical growth rate level and reach 4.4% by the 2008-2010 period. CV's book value growth rate is expected to be 3.5% over the next five years, a significant increase from the 1% rate of growth experienced over the past five years, but about equal to internal growth projections. Also, CV's earnings per share are projected to increase at a 6.5% (VL) rate—well above the indicated sustainable growth rate—however its dividends are expected to show 3% growth over the next five years, moderating long-term sustainable growth expectations. Over the past five years, CV's earnings growth was 6% but its dividends increased at only a 0.5% rate. Investors can reasonably expect long-term sustainable growth rate in the future to be higher than the past but not as high as the company's earnings growth projections; a growth rate of 4.25% is reasonable for CV.

Regarding share growth, CV's shares outstanding increased at a 1.5% rate over the past five years. The growth the number of shares is projected by VL to increase at about a 1.2% rate between 2004 and the 2008-10 period. An expectation of share growth of 1.25% for this company is reasonable.

FE – FirstEnergy Corp. – FE's sustainable growth rate averaged 3.79% over the five-year historical period, with negative results in 2003. Absent those recent results, the company's historical sustainable growth was 4.8%. VL projects that the internal growth will increase through 2008-10, will bring sustainable growth to 5.75%. FE's book value, which increased at a 7% rate during the most recent five years, however, is expected to decline to a 5% rate in the future, below the sustainable growth projection. FE's earnings per share are projected to increase at 8.5% (VL) to 4% (First Call), and 4.1% (Zack's) rates, indicating the variability of that growth rate measure. Value Line's projections are largely a function of its three-year averaging technique, which includes FE's 2003 results in which it paid out more in dividends than it took in in earnings, thereby depressing the base year average and causing the projected earnings to overstate long-term expectations. FE's dividends are expected to grow at a 4% rate, moderating long-term growth expectations. Historically FE's earnings grew at a 2.5% rate, according to Value Line, and its dividends showed no growth over the past five years. On a compound growth rate basis using 2004 projections as the final year, FE's earnings grew at only about a 2.6% rate historically. The projected sustainable growth, earnings and book value growth rate data indicate that investors can expect the growth from FE in the future to be higher than that which has existed in the past. Investors can reasonably expect a sustainable growth rate of 4.75% for FE.

Regarding share growth, FE's shares outstanding showed a 10% increase over the past five years. However, FE's growth rate in shares outstanding is expected to fall to a 0% rate of increase through 2008-10. Those projections indicate that future share growth will be below past averages. An expectation of share growth of 2.0% for this company is reasonable.

PGN – Progress Energy - PGN's sustainable growth rate has averaged 3.23% over the most recent five year period, with one sub-par year. Absent that year, the average sustainable growth rate is approximately 4%. VL expects PGN's sustainable growth to fall below that historical growth rate level, to about 2%, by the 2008-2010 period. PGN's book value growth rate is expected to be 3% over the next five years, far below the 9% rate of growth experienced over the past five years. PGN's earnings per share are projected to increase at a rate of -2% (VL) to 3.7% (Zack's) to 4.0% (First Call). Its dividends are expected to grow at a 2% rate. Over the past five years, PGN's earnings growth was 6% while its dividends increased at a 3% rate. Investors can reasonably expect a sustainable growth rate in the future of 3.75% for PGN.

Regarding share growth, PGN's shares outstanding increased at approximately a 5% rate over the past five years due to a merger. That rate of increase is expected to slow in the future to 0.80% through 2008-2010. An expectation of share growth of 2% for this company is reasonable.

CIN – Cinergy - CIN's sustainable growth rate has averaged 3.10% over the most recent five year period, with a downward trend. VL expects CIN's sustainable growth to continue at a rate just above the average historical growth rate level, at about 3.75%, by the 2008-2010 period. CIN's book value growth rate is expected to be 5.5% over the next five years, above the 5% rate of growth experienced over the past five years. CIN's earnings per share are projected to increase at a rate of 5.5% (VL) to 5.0% (First Call) to 4.6% (Zack's). However, its dividends are expected to grow more slowly, at a 2% rate. Over the past five years, CIN's earnings growth was 1.5% while its dividends increased at a 0.5% rate. Investors can reasonably expect a sustainable growth rate in the future to be similar to that of the past and 3.75% is reasonable for CIN.

Regarding share growth, CIN's shares outstanding increased at approximately a 4.2% rate over the past five years. That rate of increase is expected to be reduced in the future at a 2.3% rate through 2008-2010. An expectation of share growth of 3% for this company is reasonable.

CNL – Cleco Corp. - CNL's sustainable growth rate averaged 5.03% for the five-year period, with the results in the most recent year, below that average. VL expects sustainable growth to continue at a 4.6% level through the 2008-10 period. CNL's book value growth is expected to continue to increase at a 3.5% rate, below the historical level of 4.5%. CNL's earnings per share growth is projected to show a 0.5% increase over the next five years, and its dividends are expected to show no growth, according to Value Line (First Call and Zack's project 4% earnings growth). Historically CNL's earnings increased at a 5% rate and its dividends increased at a 2.5% rate of growth, according to Value Line. Investors can reasonably expect sustainable growth from CNL to be below past averages, a sustainable internal growth rate of 4.5% is reasonable for this company.

Regarding share growth, CNL's shares outstanding grew at approximately a 2.2% rate over the past five years. The growth in the number of shares is expected by VL to be 0.4% through 2008-2010. An expectation of share growth of 1.25% for this company is reasonable.

EDE – Empire District Electric - EDE's sustainable internal growth rate averaged -1.48% over the five-year historical period, with several negative growth years. VL projects EDE's sustainable growth to rise to a level of 2.8% through

2008-10—a substantial improvement over historical results. Also, EDE's book value growth rate is expected to continue in the future at 2%, equal to the historical level of 2%. EDE's earnings per share are projected to increase at 8% to 5% according to VL & Zack's, respectively, while the analysts' surveyed by First Call project earnings growth at 2%, a substantial difference. EDE's dividends are expected to remain at a constant level over the next five years (i.e., showing 0% growth), and moderating long-term growth expectations. Sustainable growth has been relatively inconsistent for this company, historically and is expected to trend upward in the future. Dividend growth has been non-existent. Also Value Line's earnings growth projection is skewed upward by their inclusion of the company's 2002 and 2004 earnings in its "base" three-year period. Investors can reasonably expect a sustainable growth rate of 3.75% from EDE.

Regarding share growth, EDE's shares outstanding grew at about a 9.9% rate over the past five years, due primarily to a large equity issuance in 2002. The level of share growth is expected by VL to drop to 1.1% through 2008-10. An expectation of share growth of 3.75% for this company is reasonable.

ETR – Entergy Corp. - ETR's internal sustainable growth rate has averaged 5.72% over the most recent five year period (2000-2004), with results in 2004 below the historical growth rate level. Sustainable growth is expected to be about 4.9% by the 2008-10 period. However, ETR's book value growth rate is expected to be 5% over the next five years—equal to the 5% rate of growth experienced over the past five years—pointing to steady growth expectations for the future. ETR's earnings per share are projected to increase at a rate of from about 6.5% (VL) to 6.9% (Zack's) to 6.1% (First Call). After showing negative growth historically ETR's dividends are expected to grow at a high 11.5%, supporting higher sustainable growth expectations. Over the past five years, ETR's earnings grew at a 8.5% rate while its dividends showed -3.5% growth. Investors can reasonably expect a sustainable growth rate in the future above past averages, 6.0% is reasonable for ETR.

Regarding share growth, ETR's shares outstanding grew at a -0.3% rate over the past five years. The number of shares outstanding is projected by VL to continue to decline at approximately a 0.1 rate through 2007-09. An expectation of share growth of -0.2% for this company is reasonable.

HE – Hawaiian Electric Industries, Inc. - HE's sustainable growth rate has averaged 1.89% over the most recent five year period (1999-2003), with higher growth in the three most recent years, indicating an increasing trend. VL expects HE's sustainable growth to increase from that historical growth rate level to reach 4% by the 2007-2009 period. Also, HE's book value growth rate is expected to be 3.5% over the next five years, a significant increase from the 1.5% rate of growth experienced over the past five years. HE's earnings per share are projected to increase at a 4% (Value Line) to 3.8% (Zack's) to 2.50% (First Call) rate. The company's dividends are expected to show 1% growth over the next five years. Over the past five years, HE's earnings grew at a 3% rate while its dividends increased at only a 0.5% rate. Investors can reasonably expect a sustainable growth rate in the future of 3.5% for HE.

Regarding share growth, HE's shares outstanding grew at a 4% rate over the past five years. The number of shares is projected by VL to increase at about a 1.25% between 2003 and the 2007-09 period. An expectation of share growth of 1.75% for this company is reasonable.

PNM Resources – PNM - PNM's sustainable growth rate has averaged 6% over the most recent five year period with a declining trend. VL expects PNM's sustainable growth to fall below that historical average growth rate level to about 3.7% by the 2007-2009 period. PNM's book value growth rate is expected to be 4% over the next five years, down from the 6% rate of growth experienced over the past five years. Also, PNM's earnings per share are projected to increase at a negative 0.5% (VL) to 4.1% (First Call) to 5% (Zack's) rate—a wide differential. Also, its dividends are expected to grow at 4.5%, increasing long-term growth rate expectations. Over the past five years, PNM's earnings growth was 4.5% while its dividends increased at an 8% rate. Investors can reasonably expect a sustainable growth rate in the future of 5.5% for PNM.

Regarding share growth, PNM's shares outstanding increased at approximately a -.25% rate over the past five years. The number of shares outstanding in 2007-2009 is expected to show a 0.2% increase from 2003 levels. An expectation of share growth of 0% for this company is reasonable.

Pinnacle West – PNW - PNW's sustainable growth rate has averaged 5.32% over the most recent five-year period with a downward trend. VL expects PNW's sustainable growth to fall below that historical average growth rate level to 3.22% by the 2007-2009 period. PNW's book value growth rate is expected to be 3.5% over the next five years, below the 4.5% rate of growth experienced over the past five years, confirming lower growth expectations for this firm. Also, PNW's earnings per share is projected to increase at a 2.5% (VL) to 4.5% (First Call) to 5.2% (Zack's) rate—above the indicated internal growth rate. PNW's dividends are expected to grow at a 4.5% rate, supporting long-term growth rate expectations. Over the past five years, PNW's earnings growth was 1.5% while its dividends increased at a 7.5% rate. Investors can reasonably expect a sustainable growth rate in the future of 4.5% for PNW.

Regarding share growth, PNW's shares outstanding increased at approximately a 1.8% rate over the past five years due to a share issuance in 2002. The number of shares outstanding in 2006-2008 is expected to show effectively no increase from 2000 levels. An expectation of share growth of 0.25% for this company is reasonable.

CORROBORATIVE EQUITY CAPITAL COST ESTIMATION METHODS

CAPITAL ASSET PRICING MODEL

Q. PLEASE DESCRIBE THE CAPITAL ASSET PRICING MODEL (CAPM) YOU USED TO ARRIVE AT AN ESTIMATE FOR THE COST RATE OF THE COMPANY'S EQUITY CAPITAL.

A. The CAPM states that the expected rate of return on a security is determined by a risk-free rate of return plus a risk premium that is proportional to the non-diversifiable (systematic) risk of a security. Systematic risk refers to the risk associated with movements in the macro-economy (the economic "system") and, thus, cannot be eliminated through diversification by holding a portfolio of securities. The beta coefficient (β) is a statistical measure that attempts to quantify the non-diversifiable risk of the return on a particular security against the returns inherent in general stock market fluctuations. The formula is expressed as follows:

$$k = r_f + \beta(r_m - r_f), \quad (i)$$

where "k" is the cost of equity capital of an individual security, " r_f " is the risk-free rate of return, " β " is the beta coefficient, " r_m " is the average market return and " $r_m - r_f$ " is the market risk premium. The CAPM is used in my analysis, not as a primary cost of equity analysis, but as a check of the DCF cost of equity estimate. Although I believe the CAPM can be useful in testing the reasonableness of a cost of capital estimate, certain theoretical shortcomings of this model (when applied in cost of capital analysis) reduce its usefulness.

Q. CAN YOU EXPLAIN WHY YOU APPLY THE CAPM ANALYSIS WITH CAUTION?

A. Yes. The reasons why the CAPM should be used in cost of capital analysis with caution

are set out below. It is important to understand that my caution with regard to the use of the CAPM in a cost of equity capital analysis does not indicate that the model is not a useful description of the capital markets. Rather, it recognizes that in the practical application of the CAPM to cost of capital analysis there are problems that can cause the results of that type of analysis to be less reliable than other, more widely accepted models such as the DCF.

The CAPM was originally designed as a point-in-time tool for selecting stock portfolios that matched a particular investor's risk/return preference. Its use in rate of return analysis to estimate multi-period return expectations for one stock or one type of stock, rather than a diversified portfolio of stocks, takes the model out of the context for which it was intended. Also, questions regarding the fundamental applicability of the CAPM theory and the accuracy of beta have arisen recently in the financial literature.

Over the past few years there has been much comment in the financial literature over the strength of the assumptions that underlie the CAPM and the inability to substantiate those assumptions through empirical analysis. Also, there are problems with the key CAPM risk measure that indicate that the CAPM analysis is not a reliable primary indicator of equity capital costs.

Cost of capital analysis is a decidedly forward-looking, or *ex-ante*, concept. Beta is not. The measurement of beta is derived with historical, or *ex-post*, information. Therefore, the beta of a particular company, because it is usually derived with five years of historical data, is slow to change to current (i.e., forward-looking) conditions, and some price abnormality that may have happened four years ago could substantially affect beta while, currently, being of little actual concern to investors. Moreover, this same shortcoming which assumes that past results mirror investor expectations for the future plagues the market risk premium in an *ex-post*, or historically-oriented CAPM.

Also, an important study performed for the Center for Research in Security Prices at the University of Chicago Graduate School of Business shows that the assumed linear relationship between beta, risk and return (i.e., beta varies directly with risk and return) simply does not appear to exist in the marketplace. As Value Line reported in its Industry Review published in March of 1992:

Two of the most prestigious researchers in the financial community, Professors Eugene F. Fama and Kenneth R. French from the University of Chicago have challenged the traditional relationship between Beta and return in a recent paper published by the Center for Research in Security Prices. In this study, the duo traced the performance of thousands of stocks over 50 years, but found no statistical support for the hypothesis that the relationship between volatility and return is significantly different from random. (Value Line Industry Review, March 13, 1992, p. 1-8.)

Fama and French have continued their investigation of the CAPM since their 1992 article and have postulated that a more accurate CAPM would use two additional risk measures in addition to beta. However, it is important to note that while those authors tout the superiority of their three-factor CAPM to the single-beta CAPM on theoretical grounds, they recognize that there are significant problems with any type of asset pricing model when it comes to using the model to estimate the cost of equity capital. Just last year, Fama and French noted regarding the CAPM:

"The attraction of the CAPM is that it offers powerful and intuitively pleasing predictions about how to measure risk and the relation between expected return and risk. Unfortunately, the empirical record of the model is poor—poor enough to invalidate the way it is used in applications. The CAPM's empirical problems may reflect theoretical failings, the result of many simplifying assumptions. But they may also be caused by difficulties in implementing valid tests of the model....In the end, we argue that whether the model's problems reflect weaknesses in the theory or in its empirical implementation, the failure of the CAPM in empirical tests implies that most applications of the model are invalid."
(Fama, E., French, K., "The Capital Asset Pricing Model: Theory and Evidence," *Journal of Economic Perspectives*, Vol. 18, No. 3, Summer 2004, pp. 25-46)

While the recently published conclusions as to the imprecision of equity cost estimates produced by CAPM-type models does not necessarily negate the risk/return

basis of asset pricing, it does call for more accurate measures with which asset returns can be more reliably indexed. However, unless and until such indices are published and widely accepted in the marketplace, CAPM cost of equity capital estimates should be relegated to a supporting role or informational status. Therefore, I use the CAPM for informational purposes and do not rely on that methodology as a primary equity capital cost estimation technique.

Q. WHAT VALUE HAVE YOU CHOSEN FOR A RISK-FREE RATE OF RETURN IN YOUR CAPM ANALYSIS?

- A.** As the CAPM is designed, the risk-free rate is that short-term rate of return investors can realize with certainty. The nearest analog in the investment spectrum is the 13-week U. S. Treasury Bill. Although longer-term Treasury bonds have equivalent default risk to T-Bills, those longer-term government securities carry maturity risk that the T-Bills do not have. When investors tie up their money for longer periods of time, as they do when purchasing a long-term Treasury, they must be compensated for future investment opportunities forgone as well as the potential for future changes in inflation. Investors are compensated for this increased investment risk by receiving a higher yield on T-Bonds.

As I noted in my previous discussion of the macro-economy, due to a sluggish economy, the Fed acted vigorously during 2003 to lower short-term interest rates. However, the Fed has recently reversed course and, over the past six months, has increased short-term rates. Over the most recent six-week period, T-Bills have produced an average yield of 2.76% (data from *Value Line Selection & Opinion*, six most recent weekly editions¹).

Q. DO YOU BELIEVE THE USE OF A LONG-TERM TREASURY BOND RATE IS APPROPRIATE IN THE CAPM?

- A.** No. Although the selection of a long- or short-term Treasury security as the risk free rate of return to be used in the CAPM is often one of the areas of contention in applying the

¹ Current T-Bill yield, six-week average yield from *Value Line Selection & Opinion* (3/4/05-4/8/05).

model in cost of capital analysis, the use of a short-term T-Bill rate is the more theoretically correct parameter. However, the T-Bill yield can be influenced by Federal Reserve policy, and, could provide inaccurate indications of the cost of equity, especially if the yield differential between T-Bonds and T-Bills is different from long-term averages. However, with the recent increase in short-term T-Bill yields resulting from Federal Reserve credit tightening, combined with stable long-term yields, the yield differential between T-Bonds and T-Bills is about 2%, which approximates long-term averages. Therefore, for purposes of analysis in this proceeding I will use both the T-Bill and long-term Treasury bond yields for the risk-free rate in the CAPM. Also, along with those measures of the risk-free rate I use the corresponding measures of market risk premiums.

Q. WHAT HAVE YOU CHOSEN AS THE MARKET RISK PREMIUM FOR THE CAPM ANALYSIS?

A. In their 2004 edition of Stocks, Bonds, Bills and Inflation, R.G. Ibbotson Associates indicates that the average market risk premium between stocks and T-Bills over the 1926–2003 time period is 8.6% (based on an arithmetic average), and 6.7% (based on a geometric average). For long-term Treasuries, the market risk premiums are 6.6% (based on an arithmetic average) and 5.0% (based on a geometric average). I have used these values to estimate the market risk premium in the CAPM analysis. The geometric mean is based on compound returns over time and the arithmetic mean is based on the average of single-period returns.

It is important to note that, as I point out in Section I of my testimony, recent research in the field of financial economics has shown that the market risk premium data published by Ibbotson Associates—the earned return differentials that existed in the U.S. between 1926 and 2003—overstates investor-expected market risk premiums. The most recent research indicates that the return investors require over the risk-free rate ranges from 2.5% to 4.5% over long-term Treasury bonds, as opposed to the 5.0% to 6.6% estimate published by Ibbotson. Also Ibbotson, himself, has published a recent paper that

indicates the forward-looking risk premium expectation ranges between 4% and 6%.²

Therefore, the upper end of the CAPM cost of equity estimates, based on the historical Ibbotson data, should be considered to be higher than the current cost of common equity capital.

Q. IF THE IBBOTSON HISTORICAL DATA OVERSTATE THE EXPECTED MARKET RISK PREMIUM, WHY DO YOU USE THOSE DATA IN YOUR CAPM ESTIMATE OF THE COST OF COMMON EQUITY CAPITAL?

A. I continue to utilize the historical Ibbotson data in my CAPM analysis in order to be consistent with the manner in which I have traditionally used those data. I have been testifying on the subject of the cost of equity capital for more than twenty years and have consistently used the Ibbotson historical data in my CAPM analyses, and choose not to deviate from that practice at this time. The new research on the market risk premium (including a paper from Ibbotson, himself) indicates that the expected market risk premium is considerably lower than the risk premium contained in the historical data. While that information does not cause me to change my long-standing CAPM methodology of relying on the Ibbotson historical risk premium data, the current research on the topic of the market risk premium is important, deserves consideration and causes me to put less weight on the higher end of the CAPM estimates.

Q. WHAT VALUES HAVE YOU CHOSEN FOR THE BETA COEFFICIENTS IN THE CAPM ANALYSIS?

A. Value Line reports beta coefficients for all the stocks it follows. Value Line's beta is derived from a regression analysis between weekly percentage changes in the market price of a stock and weekly percentage changes in the New York Stock Exchange Composite Index over a period of five years. The average beta coefficient of the sample group of electric companies is 0.78.

² Ibbotson, R, Chen, P., "Long-Run Stock Returns: Participating in the Real Economy," *Financial Analysts Journal*, January/February 2003, pp. 88-89.

Q. WHAT IS YOUR RECOMMENDED COST OF EQUITY CAPITAL FOR THE SAMPLE OF ELECTRIC COMPANIES USING THE CAPITAL ASSET PRICING MODEL ANALYSIS?

- A. DOD 211 shows that the average Value Line beta coefficient for the group of electric companies under study is 0.78. The overall arithmetic average market risk premium of 8.6% would, upon the adoption of a 0.78 beta, become a sample group premium of 6.71% ($0.78 \times 8.6\%$). That non-specific risk premium added to the risk-free T-Bill rate of 2.76%, previously derived, yields a common equity cost rate estimate of 9.47%.

DOD 211 also shows that using an average long-term T-bond yield (4.76%)³ the CAPM produces equity cost estimates of 8.66% (geometric) and 9.91% (arithmetic). It is also important to note that the upper end of those results are predicated on Ibbotson's long-term historical market risk premiums, which current research indicates overstate actual investor expectations. Those CAPM results bracket the DCF results derived previously, supporting the reasonableness of those results.

MODIFIED EARNINGS-PRICE RATIO ANALYSIS

Q. PLEASE DESCRIBE THE MODIFIED EARNINGS-PRICE RATIO (MEPR) ANALYSIS OF THE COST OF COMMON EQUITY CAPITAL.

- A. The earnings-price ratio is calculated simply as the expected earnings per share divided by the current market price. In cost of capital analysis, the earnings-price ratio (which is one portion of this analysis) can be useful in a corroborative sense, since it can be a good indicator of the proper range of equity costs when the market price of a stock is near its book value. When the market price of a stock is *above* its book value, the earnings-price ratio *understates* the cost of equity capital. DOD 212 contains mathematical proof for this concept. The opposite is also true, i.e.; the earnings-price ratio *overstates* the cost of equity capital when the market price of a stock is *below* book value.

Under current market conditions, the electric firms under study have an average

³ The recent six-week average T-Bond yield is 4.61% (Value Line *Selection & Opinion*, 3/4/05-4/8/0505).

market-to-book ratio of 1.54 and, therefore, the average earnings-price ratio alone would understate the cost of equity for the sample group. However, it is important to emphasize that I do not use the earnings-price ratio alone as an indicator of equity capital cost rates.

Because of the relationship among the earnings-price ratio, the market-to-book ratio and the investor-expected return on equity described in DOD 212, I have modified the standard earnings-price ratio analysis by including expected returns on equity for the companies under study. It is that modified analysis that I will use to assist in estimating an appropriate range of equity capital costs in this proceeding.

Q. PLEASE EXPLAIN THE RELATIONSHIP AMONG THE EARNINGS-PRICE RATIO, THE EXPECTED RETURN ON EQUITY, AND THE MARKET-TO-BOOK RATIO.

A. As set out in Exhibit DOD 212, when the expected return (ROE) approximates the cost of equity, the market price of the utility approximates its book value and the earnings-price ratio provides an unbiased estimate of the cost of equity. When the investor-expected return on book value equity for a utility (the ROE) exceeds the investor-required return (the cost of equity capital), the market price of the firm will tend to exceed the book value. As explained above, when the market price exceeds book value, the earnings-price ratio understates the cost of equity capital. Therefore, when the expected equity return (ROE) exceeds the cost of equity capital, the earnings-price ratio will understate that cost rate. That is the situation that exists in the marketplace today.

Also, in situations where the expected equity return (ROE) is below what investors require for that type of investment (the cost of equity), market prices fall below book value. Further, when market-to-book ratios are below 1.0, the earnings-price ratio overstates the cost of equity capital. Thus, the expected rate of return on equity and the earnings-price ratio tend to move in a countervailing fashion around the cost of equity capital.

When market-to-book ratios are above one, the expected equity return exceeds and the earnings-price ratio understates the cost of equity capital. When market-to-book ratios are below one, the expected equity return understates and the earnings-price ratio

exceeds the cost of equity capital. Further, as market-to-book ratios get closer to 1.0, the expected return and the earnings price ratio get closer to the cost of equity capital.

Therefore, because those two parameters (the earnings price ratio and the expected ROE) "orbit" around the cost of common equity, their average provides a reasonable approximation of the cost of equity capital.

These relationships represent general rather than precisely quantifiable tendencies but are useful in corroborating other cost of capital methodologies. The Federal Energy Regulatory Commission, in its generic rate of return hearings, found this technique useful and indicated that under the circumstances of market-to-book ratios exceeding unity, the cost of equity is bounded above by the expected equity return and below by the earnings-price ratio (e.g., 50 Fed Reg. 1985, p. 21822; 51 Fed Reg. 1986, pp. 361, 362; 37 FERC J 61,287). The mid-point of these two parameters, therefore, produces an estimate of the cost of equity capital which, when market-to-book ratios are different from unity, is far more accurate than the earnings-price ratio alone.

Q. WHAT ARE THE RESULTS OF YOUR EARNINGS-PRICE RATIO ANALYSIS OF THE COST OF EQUITY FOR THE SAMPLE GROUP?

A. DOD 213 shows the First Call projected 2006 per share earnings for each of the firms in my sample group. Recent average market prices (the same market prices used in my DCF analysis), Value Line's projected return on equity for 2005 and 2008-2010 (or 2007-2009) for each of the companies are also shown.

The average earnings-price ratio for the electric sample group, 7.18%, is below the cost of equity for those companies due to the fact that their average market-to-book ratio is currently above unity. The sample electric companies' 2005 expected book equity return averages 10.05%. For the entire sample group, then, the mid-point of the earnings-price ratio and the current equity return is 8.61%.

DOD 213 also shows that the average expected book equity return over the next three- to five-year period is 10.15%, indicating stable return expectations. The midpoint of these two boundaries of equity capital cost for the whole group, i.e., the long-term projected return on book equity (10.15%) and the current earnings-price ratio (7.18%) is

8.66%, and provides another forward-looking estimate of the equity capital cost rate of an electric utility firm. The results of this MEPR analysis indicate that the DCF equity cost estimate previously derived may be overstated (i.e., too high).

MARKET-TO-BOOK RATIO ANALYSIS

Q. PLEASE DESCRIBE YOUR MARKET-TO-BOOK (MTB) ANALYSIS OF THE COST OF COMMON EQUITY CAPITAL FOR THE SAMPLE GROUP.

- A.** This technique of analysis is a derivative of the DCF model that attempts to adjust the capital cost derived with regard to inequalities that might exist in the market-to-book ratio. This method is derived algebraically from the DCF model and, therefore, cannot be considered a strictly independent check of that method. However, the MTB analysis is useful in a corroborative sense. The MTB seeks to determine the cost of equity using market-determined parameters in a format different from that employed in the DCF analysis. In the DCF analysis, the available data is "smoothed" to identify investors' long-term sustainable expectations. The MTB analysis, while based on the DCF theory, relies instead on point-in-time data projected one year and five years into the future and, thus, offers a practical corroborative check on the traditional DCF. The MTB formula is derived as follows:

Solving for "P" from Equation (1), the standard DCF model, we have

$$P = D/(k-g). \quad (ii)$$

But the dividend (D) is equal to the earnings (E) times the earnings payout ratio, or one minus the retention ratio (b), or

$$D = E(1-b). \quad (iii)$$

Substituting Equation (iii) into Equation (ii), we have

$$P = \frac{E(1-b)}{k-g} . \quad (iv)$$

The earnings (E) are equal to the return on equity (r) times the book value of that equity (B). Making that substitution into Equation (iv), we have

$$P = \frac{rB(1-b)}{k-g} . \quad (v)$$

Dividing both sides of Equation (v) by the book value (B) and noting from Equation (iii) in Appendix B that $g = br + sv$,

$$\frac{P}{B} = \frac{r(1-b)}{k-br-sv} . \quad (vi)$$

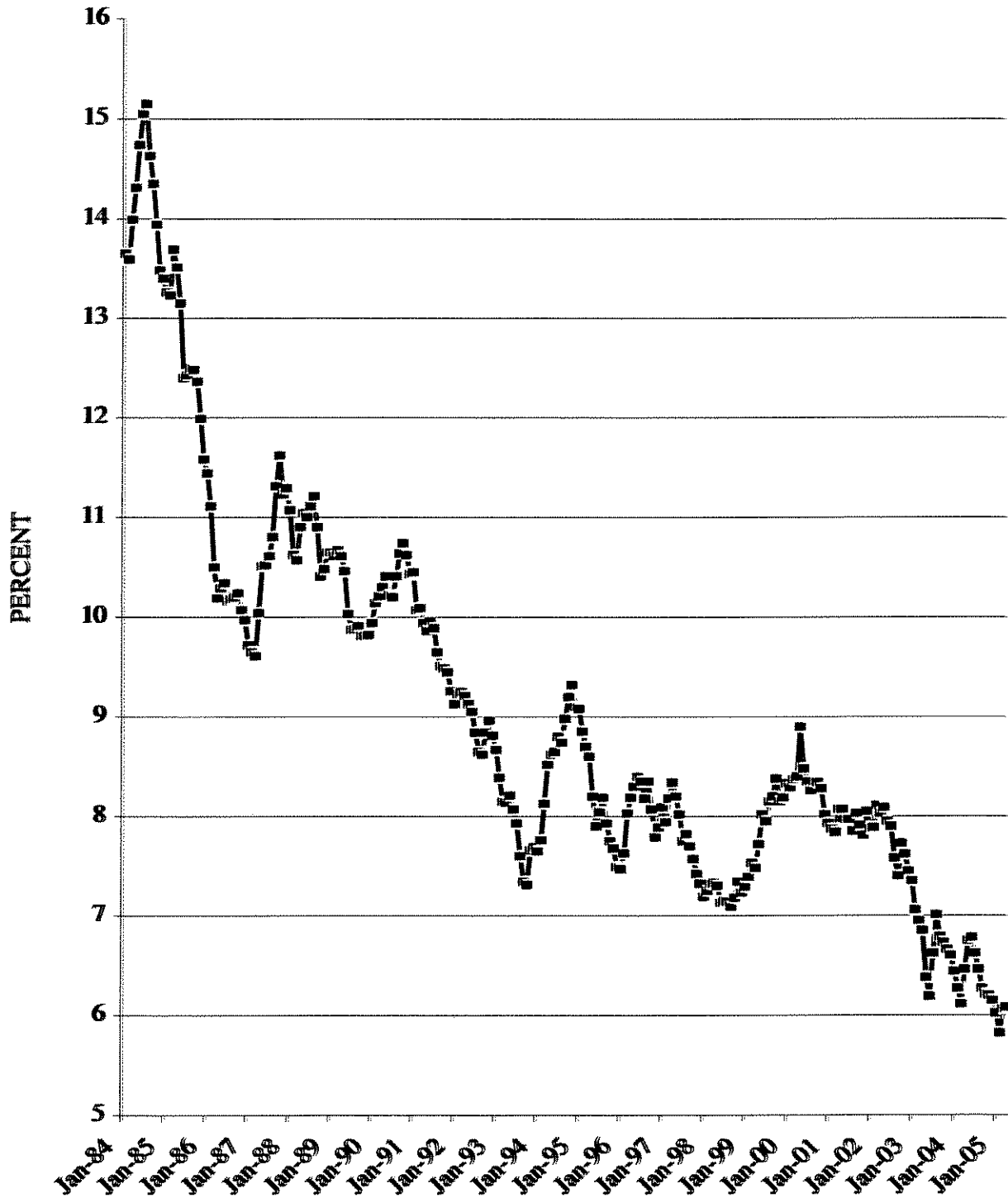
Finally, solving Equation (vi) for the cost of equity capital (k) yields the MTB formula:

$$k = \frac{r(1-b)}{P/B} + br + sv . \quad (vii)$$

Equation (vii) indicates that the cost of equity capital equals the expected return on equity multiplied by the payout ratio, divided by the market-to-book ratio plus growth, and provides a method of finding the cost of equity consistent with the observed market-to-book ratio.

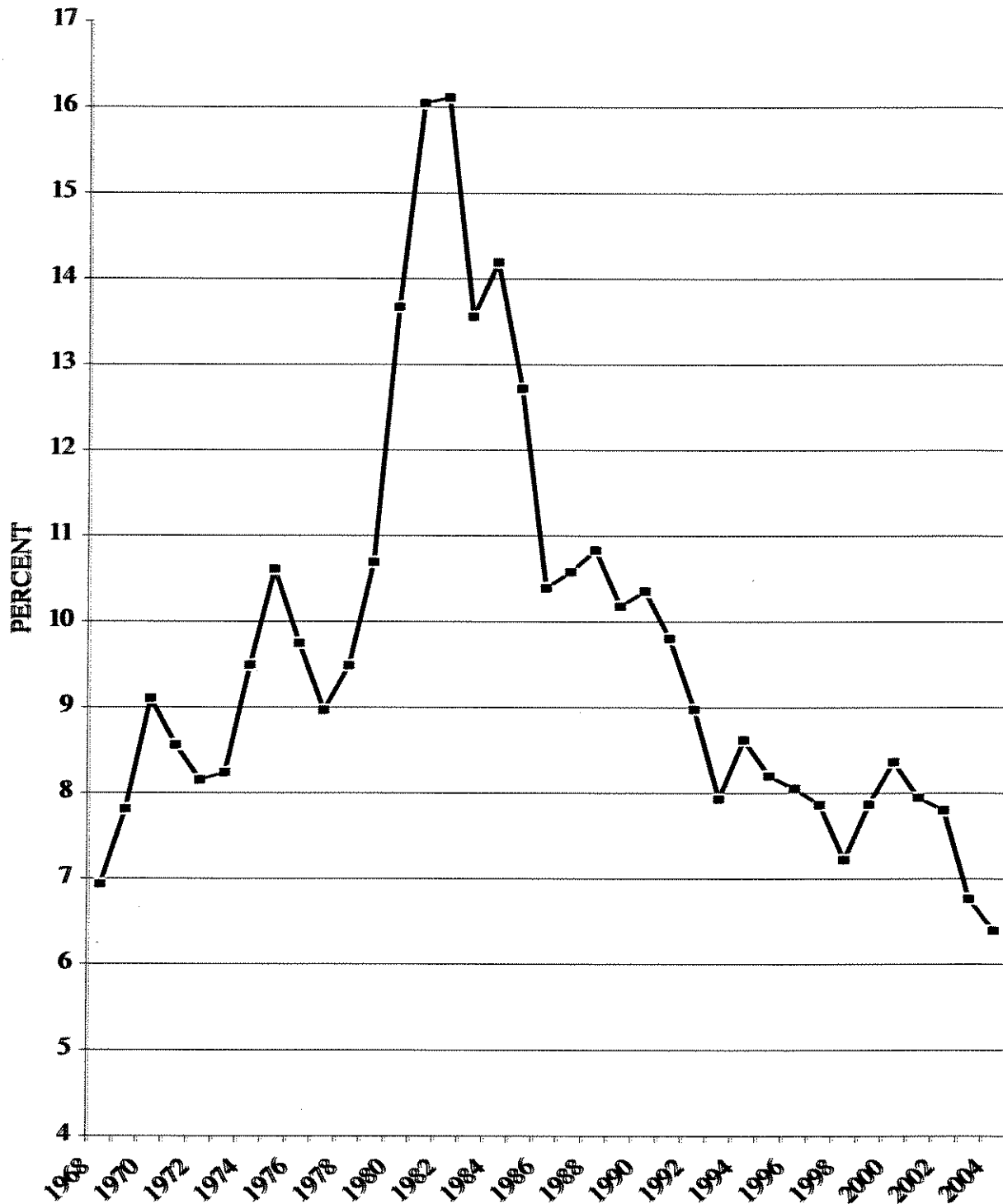
Exhibit DOD 214 shows the results of applying Equation (vii) to the defined parameters for the electric utility firms in the comparable sample. Page 1 of DOD 214 utilizes current year (2005) data for the MTB analysis while Page 2 of DOD 214 utilizes Value Line's 2008-2010 (or 2007-2009) projections. The MTB cost of equity for the entire sample of electric utility firms, recognizing a current average market-to-book ratio of 1.54 is 9.13% using the current year data and 8.92% using projected three- to five-year data.

HAWAIIAN ELECTRIC COMPANY
MOODY'S BAA BOND YIELDS
1984-2005



Data from Federal Reserve Release H15.

HAWAIIAN ELECTRIC COMPANY
MOODY'S BAA BOND YIELDS
1968-2004



Data from Federal Reserve Release H.15.

**HAWAIIAN ELECTRIC COMPANY
COMPANY REQUESTED CAPITAL STRUCTURE**

<u>Type of Capital</u>	<u>Amount (000)</u>	<u>Percent</u>	<u>Cost Rate</u>	<u>Wt. Avg. Cost Rate</u>
Common Equity	\$641,955	55.30%	-	-
Preferred Stock	\$20,476	1.76%	5.54%	0.10%
Hybrid Securities	\$27,303	2.35%	7.55%	0.18%
Long-term Debt	\$423,565	36.49%	6.25%	2.28%
Lease Obligation	\$10,115	0.87%	5.79%	0.05%
Short-term Debt	\$37,429	3.22%	3.50%	0.11%
	\$1,160,843	100.00%		

Data from HECO-2101(updated 5/5/05)

**HAWAIIAN ELECTRIC COMPANY
HISTORICAL CAPITAL STRUCTURE
(Consolidated)**

AMOUNT

<u>Type of Capital</u>	<u>2004</u>	<u>2003</u>	<u>2002</u>	<u>2001</u>	<u>2000</u>
Common Equity	\$640,892	\$582,562	\$570,480	\$539,060	\$494,295
Preferred Stock	\$22,293	\$22,293	\$22,293	\$22,293	\$22,293
Hybrid Securities	\$30,000	\$60,000	\$60,000	\$60,000	\$60,000
Long-term Debt	\$436,503	\$434,824	\$432,597	\$407,676	\$390,218
Short-term Debt	\$61,460	\$20,700	\$13,700	\$42,697	\$91,362
TOTAL	\$1,191,148	\$1,120,379	\$1,099,070	\$1,071,726	\$1,058,168

PERCENTAGE

<u>Type of Capital</u>	<u>2004</u>	<u>2003</u>	<u>2002</u>	<u>2001</u>	<u>2000</u>
Common Equity	53.80%	52.00%	51.91%	50.30%	46.71%
Preferred Stock	1.87%	1.99%	2.03%	2.08%	2.11%
Hybrid Securities	2.52%	5.36%	5.46%	5.60%	5.67%
Long-term Debt	36.65%	38.81%	39.36%	38.04%	36.88%
Short-term Debt	5.16%	1.85%	1.25%	3.98%	8.63%
TOTAL	100.00%	100.00%	100.00%	100.00%	100.00%

Data from CA-IR-492.

**HAWAIIAN ELECTRIC COMPANY
ELECTRIC UTILITY INDUSTRY COMMON EQUITY RATIOS**

<u>ELECTRIC COMPANIES</u>	<u>EQUITY RATIO</u>	<u>COMBINATION GAS & ELECTRIC COMPANIES</u>	<u>EQUITY RATIO</u>
ALLETE	62%	AES Corp.	8%
American Electric Power	41%	Allegheny Energy	20%
Central Vermont P.S.	60%	Alliant Energy	47%
Cleco Corporation	46%	Ameren Corp.	49%
DPL, Inc.	33%	Aquila	32%
DQE, Inc.	33%	Avista Corp.	39%
Edison International	35%	Black Hills Corp.	-
El Paso Electric Co.	40%	CenterPoint Energy	-
Empire District Electric	48%	CH Energy Group	58%
FirstEnergy Corp.	43%	CINergy Corp.	43%
FPL Group	44%	CMS Energy Corp.	19%
Great Plains Energy	46%	Consolidated Edison	49%
Green Mountain Power	52%	Constellation Energy	46%
Hawaiian Electric Industries	29%	Dominion Resources	39%
IDACORP	48%	DTE Energy Company	39%
Maine & Maritimes Corp.	53%	Duke Energy	46%
OGE Energy	75%	Energy East Corp.	39%
Otter Tail Power	57%	Entergy Corp.	53%
Pinnacle West Capital Corp.	47%	Exelon Corp.	41%
Progress Energy Inc.	42%	Florida Pub. Utilities	43%
Southern Co.	42%	MDU Resources	64%
TXU Corp.	-	MGE Resources	57%
UIL Holdings	53%	NiSource Inc.	42%
Westar Energy	45%	Northeast Utilities	33%
		NSTAR	37%
AVERAGE	47%	Pepco Holdings	36%
		PG&E Corp.	47%
"A" Bond Rating	47%	PNM Resources	50%
		PPL Corp.	35%
		Public Service Ent. Group	-
		Puget Energy	39%
		SCANA Corp.	40%
		SEMPRA Energy	48%
		Sierra Pacific Resources	27%
		TECO Energy	30%
		Unitil Corp.	40%
		Unisource Energy	30%
		Vectren Corp.	43%
		Wisconsin Energy Corp.	40%
		WPS Resources	47%
		Xcel Energy Inc.	42%
		AVERAGE	40%
		"A" Bond Rating	44%

Hill Sample Group (w/o HEI) = 48%
Morin Moody's Sample Group = 43%
Morin Investment Grade Sample Group (w/o HEI) = 43%
Morin Gas Sample Group = 44%

**HAWAIIAN ELECTRIC COMPANY
RATEMAKING CAPITAL STRUCTURE**

<u>Type of Capital</u>	<u>Amount</u> (000)	<u>Percent</u>	<u>Cost Rate</u>	<u>Wt. Avg.</u> <u>Cost Rate</u>
Common Equity	\$641,955	55.79%	9.00%	5.02%
Preferred Stock	\$20,476	1.78%	5.54%	0.10%
Hybrid Securities	\$27,303	2.37%	7.55%	0.18%
Long-term Debt	\$423,565	36.81%	6.25%	2.30%
Short-term Debt	<u>\$37,429</u>	<u>3.25%</u>	<u>3.50%</u>	<u>0.11%</u>
	\$1,150,728	100.00%		7.71%

HAWAIIAN ELECTRIC COMPANY
LEVERAGE/BETA ADJUSTMENT TO COMPANY'S COST OF EQUITY CAPITAL

<u>COMPANY</u>	<u>COMMON EQUITY</u>	<u>FIXED INCOME CAPITAL</u>	<u>M/B RATIO</u>	<u>MKT. VALUE DEBT(1-t)/EQ.</u>
Central Vermont P. S.	60.00%	40.00%	1.19	0.36
FirstEnergy Corp.	43.00%	57.00%	1.50	0.57
Progress Energy	42.00%	58.00%	1.32	0.68
Cinergy Corp.	43.00%	57.00%	1.70	0.51
Cleco Corporation	46.00%	54.00%	1.84	0.41
Empire District Electric	48.00%	52.00%	1.55	0.45
Entergy Corp.	53.00%	47.00%	1.75	0.33
PNM Resources	50.00%	50.00%	1.45	0.45
Pinnacle West Capital	47.00%	53.00%	1.34	0.55
AVERAGES	48.00%	52.00%	1.52	0.48
TARGET (HECO CAP. STRUC.)	55.79%	44.21%	1.52	0.34

AVERAGE (LEVERED) UTILITY BETA = 0.79

$$\text{Beta (Unlevered)} = \text{Beta (Levered)} / (1 + D(1-t)/E)$$

$$\text{Beta (Unlevered)} = 0.79 / (1 + .48) = \mathbf{0.53}$$

$$\text{Beta (Relevered)} = \text{Beta (Unlevered)} * (1 + D(1-t)/E)$$

$$\text{Beta (Relevered)} = 0.53(1.34) = \mathbf{0.71}$$

IMPACT ON COST OF EQUITY CAPITAL

$$\text{Measured Beta} = \mathbf{0.79}$$

$$\text{Relevered Beta} = \mathbf{0.71}$$

$$[1] \quad \text{Diff. in Beta} = \mathbf{0.08}$$

$$[2] \quad \text{Market Risk Premium (mm-rf)} = \mathbf{5\% \text{ to } 6.6\%}$$

$$\text{Average Cost of equity impact} = [1] \times [2] = \mathbf{0.37\% \text{ to } 0.49\%}$$

**HAWAIIAN ELECTRIC COMPANY
ELECTRIC UTILITY SAMPLE GROUP SELECTION**

Company Name	Revenues	Pending	Recent	Generation	Subst.	Bond Rating		Select
	% Electric	MegaW	Dis. Cnt?	Assets?	Book Value?	S&P	Moody's	
SCREEN	70%	no	no	yes	yes	BBB+ to BBB-		
EAST								
evg Allegheny Energy	99	no	yes	yes	no	BBB	Baa1	
evg CB Energy	54	no	no	yes	yes	A	A2	
e Central Vermont P. S.	100	no	no	yes	yes	BBB+	-	✓
evg Consolidated Edison	58	no	no	no	yes	A	A1	
evg Constellation Energy	16	no	yes	yes	yes	A	A1	
e Duquesne Light Holdings	86	no	yes	no	no	BBB+	Baa1	
evg Dominion Resources	39	no	no	yes	yes	A	A2	
evg Duke Energy	22	no	no	yes	no	BBB	Baa2	
evg Energy East Corp.	58	no	no	yes	yes	BBB+	Baa1	
evg Exelon Corp.	70	no	no	yes	yes	A	A2	
e FPL Group	83	no	no	yes	yes	A	Aaa	
e FirstEnergy Corp.	69	no	no	yes	yes	BBB	Baa1	✓
e Green Mountain Power	100	no	yes	yes	yes	BBB	Baa1	
evg Northeast Utilities	88	no	no	yes	yes	BBB+	A3	
evg NSTAR	80	no	no	no	yes	A	A1	
evg PPL Corporation	67	no	yes	no	no	A	Baa1	
evg Pepco Holdings, Inc.	61	no	no	yes	no	A	A3	
e Progress Energy	73	no	no	yes	yes	BBB	A2	✓
evg Public Service Ent. Gp.	63	no	no	yes	yes	A	A3	
evg SCANA Corp.	43	no	no	yes	yes	A	A1	
e Southern Company	92	no	no	yes	yes	A+	A1	
evg TECO Energy	61	no	yes	yes	no	BBB-	Baa2	
e UHL Holdings Corp.	65	no	no	no	yes	-	Baa2	
CENTRAL								
e ALLETE	39	no	no	yes	no	A	Baa1	
evg Alliant Energy	70	no	yes	yes	yes	A	A2	
evg Ameren Corp.	83	no	no	yes	yes	A	A1	
e American Electric Power	76	no	yes	yes	no	BBB	Baa1	
evg Aquila, Inc.	44	no	yes	yes	yes	B	B2	
evg CMS Energy Corp.	47	no	yes	yes	no	BBB-	Baa3	
evg CenterPoint Energy	16	no	yes	no	no	BBB	Baa2	
evg Cinergy Corp.	77	no	no	yes	yes	BBB-	Baa3	✓
e Cleco Corporation	96	no	no	yes	yes	BBB+	A3	✓
e DPL Inc.	99	no	no	yes	no	BBB-	Baa3	
evg DTE Energy	19	no	no	yes	yes	BBB+	Baa2	
e Empire District Electric	95	no	no	yes	yes	A	Baa1	✓
evg Entergy Corp.	78	no	no	yes	yes	A	Baa2	✓
e Great Plains Energy	44	no	no	yes	yes	BBB	A2	
evg MGE Energy	39	no	no	yes	yes	A+	Aaa	
evg NicSource Inc.	17	no	yes	yes	yes	BBB	Baa2	
e OGE Energy Corp.	32	no	no	yes	yes	BBB+	Baa2	
e Oneida Corp.	30	no	no	yes	yes	BBB+	A2	
evg TXU Corp.	22	no	yes	no	yes	BBB	Baa1	
evg Vantec Corp.	38	no	no	yes	no	A	A3	
evg WPS Resources	18	no	no	yes	yes	A+	Aaa	
e Western Energy	109	no	yes	yes	no	BBB	Baa3	
evg Wisconsin Energy	62	no	yes	yes	yes	A	A1	
WEST								
evg Avista Corp.	54	no	yes	yes	no	BBB-	Baa3	
e Black Hills Corp.	16	no	no	yes	yes	BBB	Baa1	
e Edison International	83	no	yes	yes	no	BBB+	A3	
e El Paso Electric	99	no	yes	yes	yes	BBB	Baa2	
e Hawaiian Electric	81	no	no	yes	yes	BBB	Baa2	✓
e HD&COMP, Inc.	97	no	yes	yes	yes	A	A3	
evg MDU Resources Group	7	no	no	yes	yes	A	A2	
evg PG&E Corp.	71	no	yes	yes	no	BBB	Baa1	
evg PNM Resources	49	no	no	yes	yes	BBB	Baa2	✓
e Pinnacle West Capital	70	no	no	yes	yes	BBB	A2	✓
evg Puget Energy, Inc.	35	no	yes	yes	yes	BBB	Baa2	
evg Sempa Energy	48	no	yes	yes	yes	A+	A1	
evg Sierra Pacific Resources	94	no	yes	yes	no	BB+	Baa2	
evg Unicom Energy	84	yes	yes	yes	yes	BBB-	Baa2	
evg Xcel Energy, Inc.	75	no	yes	yes	no	A	A3	

e= electric company, evg=combination electric and gas company

Data from Value Line Ratings & Reports, February 11, March 4, and April 1, 2005; AES Utility Reports, April 2005.

**HAWAIIAN ELECTRIC COMPANY
DCF GROWTH RATE PARAMETERS**

COMPANY	INTERNAL GROWTH				EXTERNAL GROWTH	
CV	RETENTION RATIO	EQUITY RETURN	"E" %	BOOK VALUE (\$/SHARE)	SHARES OUTST (MILLIONS)	SHARE GROWTH
2000	0.2281	06.9%	1.57%	16.57	11.51	
2001	0.0538	05.8%	0.31%	15.81	11.61	
2002	0.4286	09.3%	3.99%	16.83	11.74	
2003	0.3759	08.1%	3.04%	17.89	11.81	
2004	0.3655	08.0%	2.92%	18.55	12.25	
AVERAGE GROWTH			2.37%	1.00%		1.57%
2005	0.3935	08.5%	3.35%		12.50	2.04%
2006	0.4182	08.5%	3.55%		12.65	-0.50%
2008-2010	0.4600	09.5%	4.37%	3.50%	13.00	1.20%

COMPANY	INTERNAL GROWTH				EXTERNAL GROWTH	
FE	RETENTION RATIO	EQUITY RETURN	"E" %	BOOK VALUE (\$/SHARE)	SHARES OUTST (MILLIONS)	SHARE GROWTH
2000	0.4424	12.9%	5.71%	20.72	224.53	
2001	0.4718	08.9%	4.20%	24.86	297.64	
2002	0.4094	10.5%	4.30%	23.92	297.64	
2003	-0.0204	05.4%	-0.11%	25.13	329.84	
2004	0.4585	10.6%	4.86%	26.05	329.84	
AVERAGE GROWTH			3.79%	7.00%		10.09%
2005	0.4107	10.0%	4.11%		329.84	0.00%
2006	0.5014	11.5%	5.77%		329.84	0.00%
2008-2010	0.5000	11.5%	5.75%	5.00%	329.84	0.00%

COMPANY	INTERNAL GROWTH				EXTERNAL GROWTH	
PGN	RETENTION RATIO	EQUITY RETURN	"E" %	BOOK VALUE (\$/SHARE)	SHARES OUTST (MILLIONS)	SHARE GROWTH
2000	0.1111	06.7%	0.74%	26.32	206.09	
2001	0.3761	11.5%	4.33%	27.45	218.73	
2002	0.4323	12.1%	5.23%	28.73	232.43	
2003	0.3372	10.9%	3.68%	30.26	246.00	
2004	0.2267	09.5%	2.15%	31.05	248.00	
AVERAGE GROWTH			3.23%	9.00%		4.74%
2005	0.2563	10.0%	2.56%		250.00	0.81%
2006	0.2716	10.0%	2.72%		252.00	0.80%
2008-2010	0.2188	09.0%	1.97%	3.00%	258.00	0.79%

**HAWAIIAN ELECTRIC COMPANY
DCF GROWTH RATE PARAMETERS**

COMPANY	INTERNAL GROWTH				EXTERNAL GROWTH	
CIN	RETENTION RATIO	EQUITY RETURN	"E"	BOOK VALUE (\$/SHARE)	SHARES OUTST (MILLIONS)	SHARE GROWTH
2000	0.2800	14.5%	4.06%	17.36	158.97	
2001	0.3455	15.0%	5.18%	18.45	159.40	
2002	0.1892	10.9%	2.06%	19.53	168.66	
2003	0.2428	11.7%	2.84%	20.74	178.44	
2004	0.1376	09.7%	1.33%	21.95	187.53	
AVERAGE GROWTH			3.10%	5.00%		4.22%
2005	0.3018	11.0%	3.32%		200.00	6.65%
2006	0.3574	12.0%	4.29%		202.70	3.97%
2008-2010	0.3397	11.0%	3.74%	5.50%	209.80	2.27%

COMPANY	INTERNAL GROWTH				EXTERNAL GROWTH	
CNL	RETENTION RATIO	EQUITY RETURN	"E"	BOOK VALUE (\$/SHARE)	SHARES OUTST (MILLIONS)	SHARE GROWTH
2000	0.4178	14.9%	6.23%	10.04	44.99	
2001	0.4238	14.6%	6.19%	10.69	44.96	
2002	0.4079	13.1%	5.34%	11.77	47.04	
2003	0.2857	12.5%	3.57%	10.09	47.18	
2004	0.3182	12.0%	3.82%	10.90	49.15	
AVERAGE GROWTH			5.03%	4.50%		2.24%
2005	0.3333	12.5%	4.17%		49.25	0.20%
2006	0.3571	12.5%	4.46%		49.50	0.36%
2008-2010	0.4000	11.5%	4.60%	3.50%	50.25	0.44%

COMPANY	INTERNAL GROWTH				EXTERNAL GROWTH	
EDE	RETENTION RATIO	EQUITY RETURN	"E"	BOOK VALUE (\$/SHARE)	SHARES OUTST (MILLIONS)	SHARE GROWTH
2000	0.0519	09.8%	0.51%	13.65	17.60	
2001	-1.1695	03.9%	-4.56%	13.58	19.76	
2002	-0.0756	07.8%	-0.59%	14.59	22.57	
2003	0.0078	07.8%	0.06%	15.17	24.98	
2004	-0.4884	05.8%	-2.83%	14.76	25.70	
AVERAGE GROWTH			-1.48%	2.00%		9.93%
2005	0.0519	09.0%	0.47%		26.00	1.17%
2006	0.1467	10.0%	1.47%		26.30	1.16%
2008-2010	0.2686	10.5%	2.82%	2.00%	27.20	1.14%

**HAWAIIAN ELECTRIC COMPANY
DCF GROWTH RATE PARAMETERS**

COMPANY	INTERNAL GROWTH				EXTERNAL GROWTH	
ETR	RETENTION RATIO	EQUITY RETURN	"g" %	BOOK VALUE (\$/SHARE)	SHARES OUTST (MILLIONS)	SHARE GROWTH
2000	0.5892	09.7%	5.72%	31.89	219.60	
2001	0.5844	09.3%	5.44%	33.78	220.73	
2002	0.6359	10.9%	6.93%	35.24	222.42	
2003	0.5664	09.8%	5.55%	38.02	228.90	
2004	0.4947	10.0%	4.95%	38.30	216.80	
AVERAGE GROWTH			5.72%	5.00%		-0.32%
2005	0.5196	11.5%	5.98%		215.00	-0.83%
2006	0.4979	11.5%	5.73%		216.00	-0.18%
2008-2010	0.4426	11.0%	4.87%	5.00%	216.00	-0.07%

COMPANY	INTERNAL GROWTH				EXTERNAL GROWTH	
HE	RETENTION RATIO	EQUITY RETURN	"g" %	BOOK VALUE (\$/SHARE)	SHARES OUTST (MILLIONS)	SHARE GROWTH
1999	0.1448	11.0%	1.59%	13.16	64.43	
2000	0.0236	09.8%	0.23%	12.72	65.98	
2001	0.2250	11.8%	2.66%	13.06	71.20	
2002	0.2346	11.3%	2.65%	14.21	73.62	
2003	0.2152	10.8%	2.32%	14.36	75.84	
AVERAGE GROWTH			1.89%	1.50%		4.16%
2004	0.1448	10.0%	1.45%		80.75	6.47%
2005	0.2706	11.0%	2.98%		80.75	3.19%
2007-2009	0.3500	11.5%	4.03%	3.50%	80.75	1.26%

COMPANY	INTERNAL GROWTH				EXTERNAL GROWTH	
PNM	RETENTION RATIO	EQUITY RETURN	"g" %	BOOK VALUE (\$/SHARE)	SHARES OUTST (MILLIONS)	SHARE GROWTH
1999	0.5891	08.8%	5.18%	14.74	61.05	
2000	0.6581	10.0%	6.58%	15.76	58.68	
2001	0.7969	15.4%	12.27%	17.25	58.68	
2002	0.4673	06.5%	3.04%	16.6	58.68	
2003	0.4696	06.3%	2.96%	17.84	60.39	
AVERAGE GROWTH			6.01%	6.00%		-0.27%
2004	0.5500	07.5%	4.13%		60.50	0.18%
2005	0.5448	07.5%	4.09%		60.50	0.09%
2007-2009	0.5226	07.0%	3.66%	4.00%	61.00	0.20%

HAWAIIAN ELECTRIC COMPANY
DCF GROWTH RATE PARAMETERS

<u>COMPANY</u>	<u>INTERNAL GROWTH</u>			<u>EXTERNAL GROWTH</u>		
<u>FNW</u>	<u>RETENTION</u> <u>RATIO</u>	<u>EQUITY</u> <u>RETURN</u>	<u>"g"</u>	<u>BOOK VALUE</u> <u>(\$/SHARE)</u>	<u>SHARES OUTST</u> <u>(MILLIONS)</u>	<u>SHARE</u> <u>GROWTH</u>
1999	0.5818	12.2%	7.10%	26.00	84.83	
2000	0.5731	11.9%	6.82%	28.09	84.83	
2001	0.5842	12.5%	7.30%	29.46	84.83	
2002	0.3557	08.0%	2.85%	29.44	91.26	
2003	0.3135	08.1%	2.54%	31.00	91.29	
AVERAGE GROWTH			5.32%	4.50%		1.85%
2004	0.2962	08.0%	2.37%		91.40	0.12%
2005	0.3839	09.5%	3.65%		91.40	0.06%
2007-2009	0.3582	09.0%	3.22%	3.50%	91.40	0.02%

Data from Value Line Ratings and Reports, February 11, March 4, and April 1, 2005.

HAWAIIAN ELECTRIC COMPANY

DCF GROWTH RATES

<u>COMPANY</u>	<u>br</u>	+	<u>$sv = g^*((M/B+1)/2-1)$</u>	=	<u>g</u>
CV	4.25%	+	1.25% ((1.19 - 1)/2-1)	=	4.37%
FE	4.75%	+	2.00% ((1.50 - 1)/2-1)	=	5.25%
PGN	3.75%	+	2.00% ((1.32 - 1)/2-1)	=	4.07%
CIN	3.75%	+	3.00% ((1.70 - 1)/2-1)	=	4.80%
CNL	4.50%	+	1.25% ((1.84 - 1)/2-1)	=	5.03%
EDE	3.75%	+	3.75% ((1.55 - 1)/2-1)	=	4.79%
ETR	6.00%	+	-0.20% ((1.75 - 1)/2-1)	=	5.92%
HE	3.50%	+	1.75% ((1.76 - 1)/2-1)	=	4.17%
PNM	5.50%	+	0.00% ((1.45 - 1)/2-1)	=	5.50%
PNW	4.50%	+	0.25% ((1.34 - 1)/2-1)	=	4.54%

Average Market-to-Book Ratio = 1.54

CV = Central Vermont P. S.
FE = FirstEnergy Corp.
PGN = Progress Energy
CIN = Cinergy Corp.
CNL = Cleco Corporation
EDE = Empire District Electric
ETR = Entergy Corp.
HE = Hawaiian Electric
PNM = PNM Resources
PNW = Pinnacle West Capital

g^* = expected growth in number of shares outstanding

HAWAIIAN ELECTRIC COMPANY

GROWTH RATE COMPARISON

COMPANY	DCF	Value Line Projected			First Call	Value Line Historic			First Call & VL	5-yr Compound Hist.		
	Growth	EPS	DPS	BVPS	EPS	EPS	DPS	BVPS	AVGS.	EPS	DPS	BVPS
CV	4.37%	6.50%	3.00%	3.50%	n/a	6.00%	0.50%	1.00%	3.42%	1.90%	1.33%	2.50%
FE	5.25%	8.50%	4.00%	5.00%	4.00%	2.50%	0.00%	7.00%	4.43%	26.36%	1.92%	5.90%
PGN	4.07%	-2.00%	2.00%	3.00%	4.00%	6.00%	3.00%	9.00%	3.57%	-4.31%	2.73%	3.99%
CIN	4.80%	5.50%	2.00%	5.50%	5.00%	1.50%	0.50%	5.00%	3.57%	6.65%	1.30%	6.33%
CNL	5.03%	0.50%	0.00%	3.50%	4.00%	5.00%	2.50%	4.50%	2.86%	-1.55%	1.15%	2.57%
EDE	4.79%	8.00%	0.00%	2.00%	2.00%	-3.50%	0.00%	2.00%	1.50%	0.00%	0.00%	1.77%
ETR	5.92%	6.50%	11.50%	5.00%	6.10%	8.50%	-3.50%	5.00%	5.99%	9.14%	12.62%	4.87%
HE	4.17%	4.00%	1.00%	3.50%	2.50%	3.00%	0.50%	1.50%	2.29%	0.00%	0.00%	2.38%
PNM	5.50%	-0.50%	4.50%	4.00%	4.10%	4.50%	8.00%	6.00%	4.37%	1.65%	3.52%	4.76%
PNW	4.54%	2.50%	4.50%	3.50%	4.50%	1.50%	7.50%	4.50%	4.07%	-3.95%	6.59%	4.08%
		3.95%	3.25%	3.85%		3.50%	1.90%	4.55%		3.59%	3.12%	3.92%
AVERAGES	4.84%		3.68%		4.02%		3.32%		3.57%		3.54%	

Zack's growth rates: CV-n/a, FE-4.1%, PGN-3.7%, CIN-4.6%, CNL-4.0%, EDE-5%, ETR-6.9%,
HE-3.8%, PNM-5.0%, and PNW-5.2%. Zack's average earnings growth = 4.70%.

HAWAIIAN ELECTRIC COMPANY

STOCK PRICE, DIVIDENDS, YIELDS

<u>COMPANY</u>	<u>AVG. STOCK PRICE</u> <u>3/1/05-4/12/05</u> <u>(PER SHARE)</u>		<u>ANNUALIZED</u> <u>DIVIDEND</u> <u>(PER SHARE)</u>	<u>DIVIDEND</u> <u>YIELD</u>
CV	\$22.37	*	\$0.96	4.29%
FE	\$41.45		\$1.65	3.99%
PGN	\$42.23		\$2.36	5.59%
CIN	\$40.10		\$1.92	4.79%
CNL	\$21.01		\$0.90	4.28%
EDE	\$23.16		\$1.28	5.53%
ETR	\$70.79		\$2.16	3.05%
HE	\$26.10		\$1.24	4.75%
PNM	\$27.05		\$0.78	2.89%
PNW	\$42.59		\$1.90	4.46%
			AVERAGE	4.36%

*Dividend increase expected in next quarter. Current dividend increased by (1+g).

HAWAIIAN ELECTRIC COMPANY

DCF COST OF EQUITY CAPITAL

<u>COMPANY</u>	<u>DIVIDEND YIELD</u> <u>DOCKET NO. 04-0113</u>	<u>GROWTH RATE</u> <u>DOCKET NO. 04-0113</u>	<u>DCF COST OF</u> <u>EQUITY CAPITAL</u>
CV	4.29%	4.37%	8.66%
FE	3.99%	5.25%	9.24%
PGN	5.59%	4.07%	9.66%
CIN	4.79%	4.80%	9.59%
CNL	4.28%	5.03%	9.31%
EDE	5.53%	4.79%	10.32%
ETR	3.05%	5.92%	8.98%
HE	4.75%	4.17%	8.92%
PNM	2.89%	5.50%	8.39%
PNW	4.46%	4.54%	9.00%
		AVERAGE	9.21%
		STANDARD DEVIATION	0.55%

HAWAIIAN ELECTRIC COMPANY

CAPM COST OF EQUITY CAPITAL

$$k = rf + B (rm - rf)$$

T-BILLS

$$[rf]^* = 2.76\%$$

$$[rm - rf]^{\dagger} = 6.70\% \text{ (geometric mean)}$$

$$[rm - rf]^{\dagger} = 8.60\% \text{ (arithmetic mean)}$$

$$\text{average beta} = 0.78$$

$$k = 2.76\% + 0.78 (6.7\%/8.60\%)$$

$$k = 2.76\% + 5.23\%/6.71\%$$

$$k = 7.99\% / 9.47\%$$

T-BONDS

$$[rf]^* = 4.76\%$$

$$[rm - rf]^{\dagger} = 5.00\% \text{ (geometric mean)}$$

$$[rm - rf]^{\dagger} = 6.60\% \text{ (arithmetic mean)}$$

$$\text{average beta} = 0.78$$

$$k = 4.76\% + 0.78 (5.00\%/6.60\%)$$

$$k = 4.76\% + 3.90\%/5.15\%$$

$$k = 8.66\% / 9.91\%$$

*Current T-Bill & T-Bond yields, most recent yield from Value Line Selection & Opinion (3/4/05-4/11/05)

†Geometric and arithmetic market risk premiums from Ibbotson Associates 2004 SBBI Yearbook, p. 117.

HAWAIIAN ELECTRIC COMPANY
PROOF

If market price exceeds book value,
the market-to-book ratio is greater than 1.0,
and the earnings-price ratio understates the cost of capital.

MP = market price
BV = book value
i = cost of equity capital
r = earned return
E = earnings

1. At $MP = BV$, $i = r = \frac{E}{MP}$.
2. $E = rBV$.
3. Then, $\frac{E}{MP} = \frac{rBV}{MP}$.
4. When $BV < MP$, i.e., $\frac{BV}{MP} < 1$, then,
 - a. $\frac{E}{MP} < r$, since $\frac{E}{MP} = \frac{rBV}{MP} < r$, because $\frac{BV}{MP} < 1$;
 - b. $i < r$, since at $\frac{BV}{MP} = 1$, $i = \frac{E}{MP} = \frac{rBV}{MP}$, but if $\frac{BV}{MP} < 1$, then $i < r$; and
 - c. $\frac{E}{MP} < i$, since at $\frac{BV}{MP} = 1$, $i = \frac{E}{MP} = \frac{rBV}{MP}$, but if $\frac{BV}{MP} < 1$, then $\frac{E}{MP} < i$, because,
 - 1) $\frac{BV}{MP} < 1$, through MP increasing, and, if so, $\frac{E}{MP}$ increases, therefore, $\frac{E}{MP} < i$, or
 - 2) $\frac{BV}{MP} < 1$, through BV decreasing, and, if so, given $E = rBV$, $\frac{E}{MP}$ decreases, therefore, $\frac{E}{MP} < i$.
5. Ergo, $\frac{E}{MP} < i < r$, the cost of capital exceeds the earned return.

HAWAIIAN ELECTRIC COMPANY
MODIFIED EARNINGS-PRICE RATIO ANALYSIS

<u>COMPANY</u>	<u>First Call Projected 2006 Earnings (Per Share)</u>	<u>Market Price (Per share)</u>	<u>Earnings-Price Ratio</u>	<u>Current R.O.E. 2005</u>	<u>Projected R.O.E.* 2008-2010</u>
CV	\$1.65	\$22.37	7.37%	8.50%	9.50%
FE	\$3.19	\$41.45	7.70%	10.00%	11.50%
PGN	\$3.24	\$42.23	7.67%	10.00%	9.00%
CIN	\$3.10	\$40.10	7.73%	11.00%	11.00%
CNL	\$1.40	\$21.01	6.66%	12.50%	11.50%
EDE	\$1.50	\$23.16	6.48%	9.00%	10.50%
ETR	\$5.08	\$70.79	7.18%	11.50%	11.00%
HE	\$1.79	\$26.10	6.86%	11.00%	11.50%
PNM	\$1.85	\$27.05	6.84%	7.50%	7.00%
PNW	\$3.10	\$42.59	7.28%	9.50%	9.00%
		AVERAGE	7.18%	10.05%	
		CURRENT M.E.P.R.		8.61%	
		AVERAGE	7.18%		10.15%
		PROJECTED M.E.P.R.		8.66%	

HAWAIIAN ELECTRIC COMPANY
MARKET-TO-BOOK RATIO ANALYSIS

<u>COMPANY</u>	$k = R.O.E.(1-b)/(M/B) + g$ [2005]						<u>MARKET-TO-BOOK COST OF EQUITY</u>
CV	k=	08.5%	(1-	0.3935	)/	1.19 + 4.37%	= 8.69%
FE	k=	10.0%	(1-	0.4107	)/	1.50 + 5.25%	= 9.18%
PGN	k=	10.0%	(1-	0.2563	)/	1.32 + 4.07%	= 9.71%
CIN	k=	11.0%	(1-	0.3018	)/	1.70 + 4.80%	= 9.32%
CNL	k=	12.5%	(1-	0.3333	)/	1.84 + 5.03%	= 9.55%
EDE	k=	09.0%	(1-	0.0519	)/	1.55 + 4.79%	= 10.28%
ETR	k=	11.5%	(1-	0.5196	)/	1.75 + 5.92%	= 9.08%
HE	k=	11.0%	(1-	0.2706	)/	1.76 + 4.17%	= 8.72%
PNM	k=	07.5%	(1-	0.5448	)/	1.45 + 5.50%	= 7.85%
PNW	k=	09.5%	(1-	0.3839	)/	1.34 + 4.54%	= <u>8.91%</u>
						AVERAGE	9.13%
						STANDARD DEVIATION	0.66%

Note: Equity returns and retention ratios based on Value Line current year projections.

HAWAIIAN ELECTRIC COMPANY
MARKET-TO-BOOK RATIO ANALYSIS

<u>COMPANY</u>	$k = R.O.E.(1-b)/(M/B) + g$ [2008-2010]	<u>MARKET-TO-BOOK COST OF EQUITY</u>
CV	$k = 09.5\% (1 - 0.4600) / 1.19 + 4.37\%$	8.67%
FE	$k = 11.5\% (1 - 0.5000) / 1.50 + 5.25\%$	9.08%
PGN	$k = 09.0\% (1 - 0.2188) / 1.32 + 4.07\%$	9.40%
CIN	$k = 11.0\% (1 - 0.3397) / 1.70 + 4.80\%$	9.07%
CNL	$k = 11.5\% (1 - 0.4000) / 1.84 + 5.03\%$	8.77%
EDE	$k = 10.5\% (1 - 0.2686) / 1.55 + 4.79\%$	9.73%
ETR	$k = 11.0\% (1 - 0.4426) / 1.75 + 5.92\%$	9.43%
HE	$k = 11.5\% (1 - 0.3500) / 1.76 + 4.17\%$	8.41%
PNM	$k = 07.0\% (1 - 0.5226) / 1.45 + 5.50\%$	7.80%
PNW	$k = 09.0\% (1 - 0.3582) / 1.34 + 4.54\%$	8.85%
	AVERAGE	8.92%
	STANDARD DEVIATION	0.56%

Note: Equity returns and retention ratios based on Value Line three- to five-year projections.

**HAWAIIAN ELECTRIC COMPANY
OVERALL COST OF CAPITAL**

<u>Type of Capital</u>	<u>Amount</u> (000)	<u>Percent</u>	<u>Cost Rate</u>	<u>Wt. Avg.</u> <u>Cost Rate</u>
Common Equity	\$641,955	55.79%	9.00%	5.02%
Preferred Stock	\$20,476	1.78%	5.54%	0.10%
Hybrid Securities	\$27,303	2.37%	7.55%	0.18%
Long-term Debt	\$423,565	36.81%	6.25%	2.30%
Short-term Debt	\$37,429	3.25%	3.50%	0.11%
	\$1,150,728	100.00%		7.71%

PRE-TAX INTEREST COVERAGE* = 4.29x

*Assuming the Company experiences, prospectively, a combined income tax rate of 40%, the pre-tax overall return would be 11.12% [$7.71\% - (.18\% + 2.28\% + .11\%) = 5.12\%$ / $(1 - 40\%) = 8.53\%$ + $(.18\% + 2.32\% + .12\%)$]. That pre-tax overall return (11.12%), divided by the weighted cost of debt (.18% + 2.32% + .12%), indicates a pre-tax interest coverage of 4.29 times.

CERTIFICATE OF SERVICE

I hereby certify that one copy of the foregoing DIRECT TESTIMONY OF
STEPHEN G. HILL was duly served upon the following parties, by personal
service, hand-delivery, and/or U.S. mail, postage prepaid, and properly
addressed pursuant to HAR sec. 6-61-21(d).

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